HELSINKI SCHOOL OF ECONOMICS (HSE)
Department of Accounting and Finance

ACTIVIST HEDGE FUNDS:

A product called alpha?

Finance
Master´s thesis
Mikko Meriläinen
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Tarkastajat:

KTT, Vesa Puttonen ja
KTT, Sami Torstila

HELSINKI SCHOOL OF ECONOMICS **ABSTRACT**
Master's Thesis in Finance
Mikko Meriläinen 26.09.2007

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Objectives of the Study: The overall aim of this study is to fill the existing research gap on the risk and return characteristics of so called activist hedge funds. To my knowledge this study is the first that tries to explain the performance of activists hedge funds by hedge fund style indices and observable market risk factors. The study provides important insights to the impact of an activist hedge fund's asset size on its (abnormal) returns and risk.

Data: The analysis has been performed on a total sample of 92 activist hedge funds during January 2002 to December 2006. The majority of the funds was selected from the Lipper TASS database by either their self-claimed activism or a proven event of activism that the fund has performed. The study includes also three well-known activist investors whose performance data has been limited to only a restricted group of insiders. The control group, containing hedge funds with traditional strategies, were collected from Lipper TASS, Credit Suisse and Bloomberg databases respectively.

Methodology: The study uses several ways to analyse its research questions. Traditional performance attribution ratios are used along with two mutually exclusive style and risk factors model whose construction is in line with the existing literature in the field. The impact of a fund's size on its performance has been analysed by linear and quadratic regressions.

Results: The style models implemented in the study explain the majority of the variance in activist hedge fund's returns. The results of the study indicate that activist hedge funds have been able to generate abnormal returns against the traditional hedge fund strategies but these abnormal returns are limited only to the largest activist. Furthermore, the results show that activist hedge funds generally generate abnormal returns that cannot be explained by market factors. The abnormal return delivered to investors is approximately 5% annually - a level that is dramatically lower than general believes and rumours indicate. The study also shows that activist returns are correlated with general equity indices and derive partially from value investing in value companies with small capitalisation. In addition, the study reports that larger sized activist funds have higher abnormal returns and lower levels of risk.

Key Terms: Shareholder activism, Hedge funds, Performance attribution, Alpha

HELSINKI SCHOOL OF ECONOMICS **TIIVISTELMÄ**
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Tutkielman tarkoitus: Tutkimuksen motiivi on olla ensimmäinen julkinen tutkimus aktiivista osakkeenomistuspolitiikka harjoittavien vipurahastoiden tuotosta. Tekijän tiedossa ei ole muita tutkimuksia, joissa aktivistirahastojen tulosta olisi selvitetty vipurahastojen yleisten sijoitustyylien tai markkinaindeksien avulla. Tutkimus tuottaa uutta tietoa aktivistirahaston koon vaikutuksesta sen tuottoon, riskisyyteen sekä rahaston salkunhoitajan tuottamaan lisäarvoon.

Tiedonlähteet: Tutkimus on tehty käyttäen 92 aktivististrategiaa seuraavaa vipurahastoa. Suurin osa aktivistirahastoista raportoi tuloksensa Lipper TASS tietokantaan, josta rahastot on valikoitu niiden itse ilmoittaman aktivististrategian tai havaitun aktivistitapahtuman johdosta. Tutkielma sisältää myös tulostiedot kolmelta suurelta aktivistirahastolta, jotka eivät julkista tuloksiaan. Vertailuryhmä joka koostuu vipurahastoista, jotka seuraavat perinteisiä vipurahastostrategioita on peräisin Lipper TASS tietokannasta. Tutkimuksessa käytettään tietolähteenä mainitun tietokannan lisäksi Credit Suisse:n julkaisemia vipurahastoindeksejä sekä Bloomberg tietokantaa.

Metodologia: Tutkimus hyödyntää useita eri metodologioita luotattavien tulosten saavuttamiseksi. Perinteisiä tuottolukuja käytetään yhdessä kahden toisistaan poikkeavan regressionmallin kanssa. Toinen regressiomalli käyttää selittävänä tekijänä vipurahastojen tyylikohtaisia tuloksia, toisen mallin hyödyntäessä yleisiä markkinaindeksejä. Vipurahaston koon vaikutusta sen tulosmuuttujiin tutkitaan lineaarisella sekä toiseen potenssiin perustuvalla regressiomallilla.

Tulokset: Käytetyt mallit selittävät merkittävän osan aktivistirahastojen tuotonvaihtelusta. Tulosten perusteella on pääteltävissä, että suuret aktivistirahastot tuottavan lisäarvoa sijoittajalle verrattuna vipurahastoihin yleisellä tasolla. Tutkimus osoittaa myös, että aktivistirahastoiden tuottoa selitettäessä markkinaindekseillä ovat niiden salkunhoitajat tuottaneet lisäarvoa, mikä on selvä esimerkki aktivistisijoittamisen kannattavuudesta. Kaikki aktivistirahastot huomioiden, vuosittainen markkinoiden tuoton ylittävä lisäarvo on noin 5%, mikä on huomamatavasti yleistä uskomusta vähemmän. Tutkimustulokset osoittavat aktivistirahastoiden tuottojen olevan korreloituneita yleisten osakemarkkinoiden kanssa. Tutkimus raportoi myös aktivistirahastoiden tuottojen olevan osaltaan peräisin sijoituksista pieniin sekä arvo-osakkeisiin. Tutkimus viittaa aktivistirahastoiden tuottaman lisäarvon kasvuun sekä riskin vähentymiseen rahaston koon kasvaessa.

Avainsanat: Aktivistisijoittaja, Vipurahastot, Tulosmittaus, Salkunhoitajan lisäarvo.

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Chapter 1. Introduction

1.1 Background and motivation

"The point is ladies and gentleman, that greed -for lack of a better word- is good" summarized the character Gordon Gekko his motive for taking over a company in the 1987 movie Wall Street. The corporate raiders and other uninvited visitors in the ownership lists of publicly traded companies have been seen as incarnations of greediness in the financial markets. Two decades after the movie, the Financial Times[1] writes "activist investors have been reviled in boardrooms and parliaments across Europe for their perceived aggressive tactics and short-termism." This new type of activism accomplished by faceless investors - hedge funds - has surged dramatically during the last few years.

In the present market environment, there are not many investors more respected – and feared – than those who manage hedge funds. Hedge fund managers are free from the regulations that mutual funds manager have to follow and willing to maximize their own economic interest and that of their clients. As the amount of capital flowing into hedge funds has increased dramatically, the industry has become more powerful than ever before. The increased amount of wealth has also caused a dramatic increase in the number of hedge funds . Eroding market opportunities and fearer competition have driven an increasing number of hedge funds to a new money making strategy whose results have filled up the headlines of business news – shareholder activism is more present than ever before.

Even if hedge fund shareholder activism seems to be permanently in the business news' headlines, only a few studies have analyzed this new phenomenon. These studies mainly concentrated on the impact of hedge fund activism on the profitability of their target companies. In order to deepen the understanding of activist hedge funds, this study uses a new approach. Instead of studying the effect of activism on their target companies, I analyze the profitability of activism to the investors. Therefore, this study is the first to answer if activist hedge funds are capable of delivering abnormal returns to their investors, which is ultimately required to justify the existence and growth of activist hedge funds.

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[1] Financial Times, Monday September 10 2007

Throughout the study the concept of activist hedge fund is defined as a hedge fund with more concentrated portfolio and a strategy to go long in target companies to seek strategy changes by the company to boost the price of the stock and exist the holding after activist campaign.

1.2 Purpose and contribution

The actions of so-called activist hedge funds have an increasing economic effect on today's business world. The possibility to invest in hedge funds is limited to wealthy investors and as hedge funds are not obligated to publicly report their performance a veil of mystery covers the industry. In order to better understand the current drive to use shareholder activism seen in the hedge fund industry, I study the performance of activist hedge funds to shed light upon the profitability and characteristics of this investment strategy.

The most famous activist funds, such as The Children Investment Funds Management (TCI), have been in headlines for their high returns (on TCI's case 51.5% in 2005 and 40.5% in 2006). It is easy to pinpoint a few heroes from the group but dangerous to draw conclusions just from success stories in the news. Therefore, an empirical study is required to prove whether activist hedge funds really outperform other investment vehicles.

Contemporary studies, such as Klein and Zur (2006) or Brav et al (2006) and Clifford (2007), focus on shareholder activism efforts by hedge funds but do not offer information on the risk and return characteristics of activist hedge funds themselves. Studies on activism concentrate mostly on the wealth effect around the date upon which the activist fund makes its activist efforts public and so the risk and return characteristics of the hedge fund are not incorporated in the findings.

This thesis aims to answer the following research questions:

- Do activist hedge funds add value to their investors?
- Do activist hedge funds outperform traditional hedge fund strategies?
- Which market factors characterize activist hedge funds' performance?

To my knowledge, this study is the first attempt to analyse the performance of activist hedge funds and to try to explain it by exposures to the common markets and the traditional hedge fund investment styles. Another contribution is the unique dataset of activist funds that includes performance figures from three large activist hedge funds that are out of the range of other studies. Furthermore, the most up-to-date version of the TASS database is used: until the end of 2006.

1.3 Limitations

There is no such thing as a perfect research as certain simplifications are always required. This section shortly summarizes the main limitations that the study has.

Conventional models for constructing asset-class indices rest on the assumption that the underlying assets are reasonably homogenous and that the dominant investment strategy used is buy-and-hold. As hedge funds are not required to report their performance or holdings, the results of the study cannot be audited and a verification of this assumption is rather challenging. The problem is common and well recognized in the existing literature on hedge funds.

Hedge fund shareholder activism is a relatively new phenomenon and so the sample period and data are limited. The sample period of January 2002 – December 2006 was selected to be the first five-year period from which it was possible to collect reasonably data on shareholder activism. The results of the study should not be seen as absolute truths but merely as conclusions that are based on the sample being studied.

The description of the strategy "activism" holds the assumption of the effect of manager skills on performance. A higher exposure to "human elements" often leads the universe of activists funds to be relatively heterogeneous performance-wise. The main assumption behind the study is that, in general, activists are able to spot undervalued companies and increase their values more effectively than its management in a short-time period. As there exist better and worse performing managers, it is possible that there are better and worse performing activist funds.

Several different methodologies are implemented to spot the differences between activist hedge funds and hedge funds using more traditional strategies. However, several methods to study the matter remain out of the scope of this thesis, as for example nonparametric testing. The findings could be made more robust with these type of tests.

1.4 Outline of the thesis

After the introduction in chapter one, a review of the relevant literature is given in chapter 2 and 3 . The literature review is divided into the following two parts:

(i) The first part discusses the general background and characteristics of hedge funds and the hedge fund industry.

(ii) The second part reviews literature specific to activist shareholders, hedge funds as activists and targets of activists.

After the theoretic framework is drawn, chapter four describes the hypotheses to be studied. The purpose of this chapter is to provide the reader with a clear view on the research questions that the thesis is aimed to answer.

The fifth chapter present the data that are used in the study. After that the sixth section describes the style model based on the Credit Suisse First Boston / Tremont hedge funds Indices (CSFB Indices) and the observable market factors used in the model to explain the performance of hedge funds. Finally the linear and quadratic regression models that are used for analysing the impact of a hedge fund's size on its performance are presented and discussed. The chapter seven reports the empirical findings that the chapter eight finally concludes.

Chapter 2. Literature review on hedge funds

2.1 Overview of hedge funds

The birth of the first hedge fund dates back to 1949 when Alfred Winslow Jones founded the first known hedge fund to sell short some stocks while buying others. The hedge fund industry remained relatively unnoticeable over the years until in 1966, an article in Fortune magazine about a "hedge fund" run by a certain A. W. Jones shocked the investment community. Jones's model was based on the premise that performance depends more on superior stock selection than on market direction. He applied short sales and leverage in his portfolio that was organized as a private partnership and therefore exempted from SEC regulations. Apparently, the fund had outperformed all the mutual funds of its time, even after accounting for a hefty 20% incentive fee.

From that moment on, especially after the contraction in the 1970s and 1980s, hedge funds have soared both in terms of number of funds as well as assets under management. The macro investment funds popularized by George Soros received a lot of attention from the media as they made large bets that were not necessarily hedged nor considered as market neutral, on the currency, bond, equity and commodity markets across the globe (Slater, 1997). The increased wealth generated in the bull markets of the 1980s and 1990s helped the growth of the hedge fund industry as the investors were interested in better returns and non-correlated return profiles.

The hedge fund industry has grown from as few as 300 funds in 1990 to nearly 9000 funds managing assets worth of over 1.2 Trillion USD in 2006[2]. The rising interest in hedge funds appears to be attributable to the combination of poor equity returns and positive hedge fund returns during the equity bear market after the bullish years of 1999 and 2000. As more capital flows to the industry, it gains power and becomes more visible to the public. Figure 1, on the next page, illustrates the growth in assets that hedge funds have faced during the last decade.

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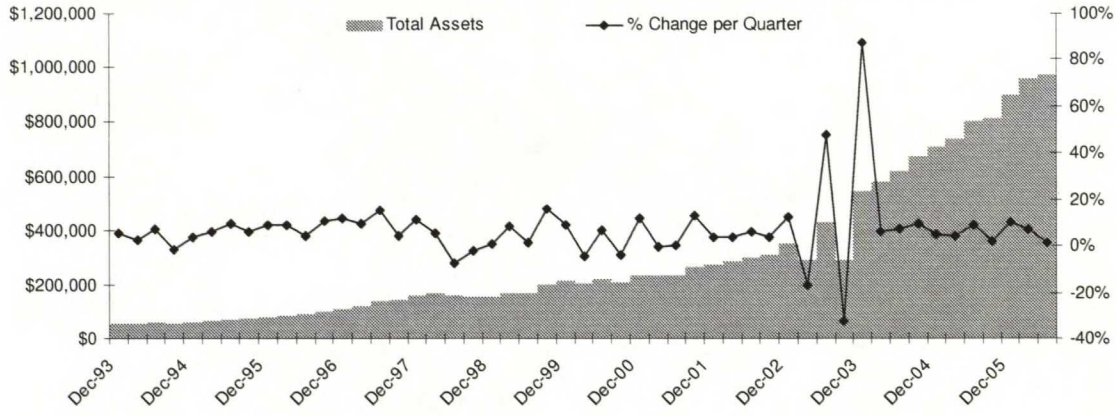
[2] Source: Hennesee Survey Dec. 2006

Figure 1: Hedge funds' total assets ($ mln) in TASS Dec 1993 - Dec 2006



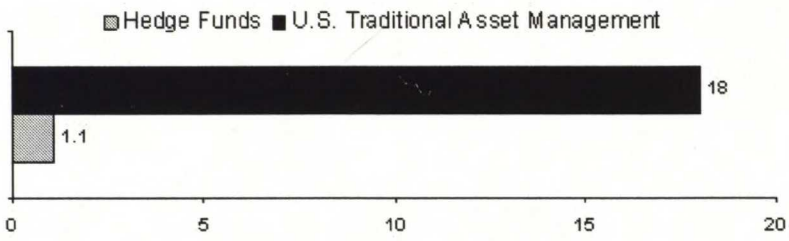
Source: Lipper TASS Asset Flow Reports Hedge Funds Fourth Quarter 2006. Note that these figures represent only part of the assets under management in hedge funds universe.

2.2 Definition of the hedge fund industry

In general, industries are defined by *what* they produce and not *how* they produce it. The business model of Dell Inc. historically was much different from that of Hewlett-Packard, but because both offer personal computers, they are categorized in the same industry. In this context, traditional active managers and hedge fund managers also attempt to deliver the same product for their customers: the proportion of return (and risk) that an active manager generates independent of the market a.k.a. alpha.

Figure 2 illustrates the portion that Citigroup estimated hedge funds to hold when compared with the U.S. active asset management in 2005. For an investor, the main difference between hedge funds and traditional active asset management is the claim that the alpha delivered by a hedge fund comes with less exposure to markets.

Figure 2: Hedge funds vs. traditional asset management in 2005



Assets Under Management in $trillion. Source: Citigroup 2005

2.3 Characteristics of hedge funds

Several academics and practitioners have come up with differing explanations on the question "What is a hedge Fund?". Conner and Woo (2003) describes a hedge fund as "... an actively managed, pooled investment vehicle that is open to only a limited group of investors and whose performance is measured in absolute return units." According to the Securities and Exchange Commission, a hedge fund is any "privately offered entity that holds a pool of securities or other assets and that is not a registered mutual fund"[3].

Hedge funds are generally classified as alternative investments[4] as they seem to have, in general, very little correlation with the traditional asset classes. Consequently, hedge funds should not be thought of as an alternative asset class per se, but rather as *investment strategies* that trade with existing asset classes to generate returns. Hedge funds as a group have certain characteristics that distinguish them from other vehicles that investors can choose.

In this chapter I summarize briefly those characteristics based on a description of one of the most well known hedge funds' research companies Tremont Advisory Services. Interestingly enough, most of the hedge fund characteristics presented in this chapter can be spotted in A. W. Jones' original hedge fund.

I. Legal structure

US-domiciled hedge funds are almost always structured as Limited Partnerships (LPs) and offshore funds are usually structured as corporations. These legal structures differentiate hedge funds from mutual funds and so liberates them from the regulations that the mutual funds are obliged to follow. The Securities and Exchange Commission (SEC) encouraged hedge fund investments by allowing the earlier limit on the number of investors per hedge fund to exceed one hundred in June 1997, while still permitting to avoid registration and disclosure requirements required from mutual funds.

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3 SEC Staff Report, Implications of the growth of hedge funds 3 (2003)

4 The term "Alternative Investments" is generally used to refer all the investment classes outside the most traditional ones. The main alternative investment classes include also Real Estate, Private Equity, Commodity Trading Advisors (CTAs) and direct investments in commodities, arts, etc..

Unlike mutual funds, hedge funds do not have legal restrictions in their investment activities and so they are able to take both long and short positions, use arbitrage, buy and sell undervalued securities, trade options or bonds, and invest in almost any opportunity in any market where it foresees impressive gains at reduced risk

II. Performance-based fee structure

In 1970 the U.S. Congress required incentive plans of the investment funds to be symmetrical in order to prevent potential risk-taking abuses from bonus incentive plans. Not so surprisingly, the mutual fund managers appear to prefer no incentive plan to the symmetric one, as they don't want to be financially punished when the markets go down. As hedge funds have a different legal structure, they are enabled to have asymmetric incentive plans and so the hedge fund managers are rewarded primarily in proportion to the profitability of the fund's investments.

The management fees of the hedge funds typically lie between 1.5% and 2.0% of the assets under management. In addition many managers get a performance fee, usually varying between 10%-50% of the profits above a certain hurdle rate that is paid from the generated profits. Ackerman et all. (1999) explains the performance of hedge funds by different factors and found out that incentive fees are the most important and significant determinants of the risk adjusted returns of hedge funds. Their study with data from 1988 to 1995 illustrates that an increase in the incentive fee from zero to the median value of 20% led to an average increase in the Sharpe ratio of 66%. Agarwal et al. (2004) argue that incentive fees can be seen as a call option that the investor writes to the fund's management. They report with their data of 1776 live and 1655 death hedge funds from 1994 to 2000 that funds with greater managerial incentives are associated with superior future performance. Many studies (e.g. Agarwal and Naik, 2000) also report that the few mutual fund managers who have beaten their benchmarks with passive strategies tend to move to alternative investments and start their own hedge fund to gain more.

III. Lack of transparency

Alfred Winslow Jones managed to operate his fund in complete secrecy for seventeen years. Hedge funds do not have to be registered with the SEC and so the hedge fund managers are not required to publicize performance information, asset allocations, or earnings. Unlike mutual fund databases, hedge fund databases are generally private listing services that introduce hedge funds to qualified investors. As a result, hedge funds that choose to post returns are generally doing so to attract investors. This lack of transparency has led to a situation that Ed Esterling (2007) describes as "..Never has an industry so extensively studied by "experts" produced such a surplus of myths, misunderstandings, and half-truths".

In reality, most hedge funds provide access to relevant data and analyses of the performance of the fund to their investor. The SEC requires all investors who own more than 5% of a certain company and are willing to take part in corporate governance to publish all their holdings in form 13D. This has caused a high level of criticism from hedge funds' managers but also enabled academics to study shareholder activism with more accurate data.

IV. Active management

To be able to earn the performance fee of 20%-50% of the profit, hedge fund managers use active management and skill-based strategies to create alpha and add value to their investors. There are several overarching techniques by which hedge fund managers seek to gain a competitive advantage. These include superior information collection; superior access to opportunities; superior analysis of opportunities; and superior trade or portfolio structuring.

V. Flexibility in investment strategies

Style drift refers to a situation where the hedge fund manager changes the investment and strategy and so the risk-return profile of the fund. Unlike mutual funds that track a specified benchmark, hedge funds have a high degree of flexibility in the investment strategies they employ. Boyson (2004) finds out that older funds (which are also larger) tend to experience more style drift (i.e., less herding among managers in the same category). Managers appear to be going outside of their core competencies, and as Boyson (2004) shows, this style drift does not improve performance.

VI. Liquidity limitations

Investing in and especially withdrawing investments from hedge funds is significantly more difficult than in the case of mutual funds. Most hedge funds allow redemptions on a quarterly basis, but very few allow redemptions more frequently than that. Some hedge funds have longer (e.g. one year) lock up periods, which refer to the minimum time that an investor is required to keep her money invested in the fund, so that the fund can properly implement its trading strategy without being concerned for fluctuations in assets. Some funds charge a redemption fee; this dissuades early redemption. The purpose of these restrictions is to enable hedge fund managers to hold illiquid positions and reduce cash holdings. There are several cases where the redemption of money from the hedge fund led to a crash of the whole portfolio.

VII. Higher personal managerial investments

A hedge fund manager generally contributes a large portion of his or her own wealth to the fund to better align his interests with those of the investors. Ackerman et al. (1999) approach hedge funds' performance with the principal agent theory and argue that intuitively, personal managerial investment should increase the effort of managers to realize high returns. On the other hand, it may make managers risk averse relative to investor's preferred risk level, as managers might be afraid of loosing a big portion of their wealth. As profit depending incentive fees stimulate risk taking, the combination of personal managerial investment and a profit-dependent incentive bonus plan may stimulate managerial actions that are more aligned with the interests of investors.

VIII. High minimum investments

Because of the limited number of investors that a US-domiciled fund can have, hedge funds often demand relatively high minimum investments from investors. Hedge funds are meant for investors who are willing to commit themselves for a long time and are interested in the non-correlation with the traditional markets that the hedge funds claim to offer. Esterling (2007) claim that in general, smaller funds tend to have more individual investors and less sophisticated operations. The larger funds tend to have more institutional investors and more sophisticated operations.

IX. Low market correlation

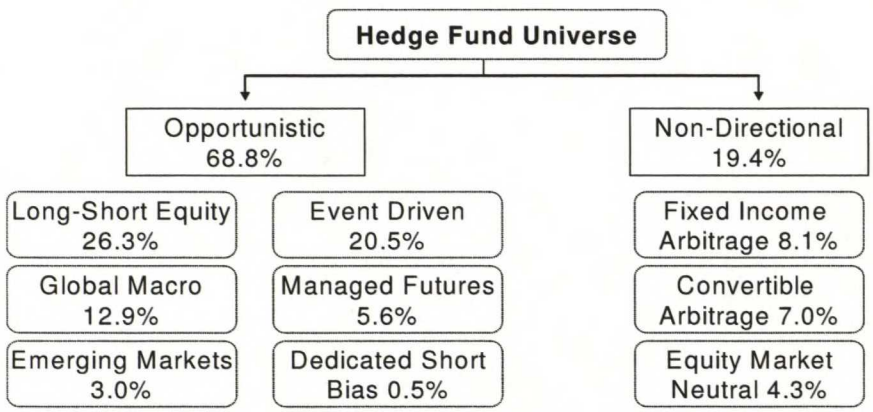
An important characteristic is the zero or low correlation of hedge funds with the markets. As there is no market benchmark for hedge funds, as is the case with mutual funds that aim to outperform their benchmarks, hedge funds aim for absolute returns that are claimed to be non-related with market trends and offer consistent positive returns.

2.4 Hedge fund strategies

Hedge funds employ a variety of trading strategies that display different risk and return characteristics [see e.g. Brown et al. (1999)]. Besides their performance and risk, the financial instruments that are used and the level of leverage differ per strategy. To be able to distinguish the various strategies, data vendors, practitioners and academics use different classifications.

In this thesis, I use the CSFB/Tremont Advisors categorization because they are mostly used in other hedge fund studies and as their indices are used in the analysis. In their approach, hedge funds can be classified into two broad categories: non-directional and opportunistic. Non-directional strategies tend to neutralize a majority of market risk, largely assuming only idiosyncratic risks (i.e., the risks inherent to individual securities), while opportunistic strategies tend to remain exposed to a degree of market risk in addition to idiosyncratic risks. These two categories can be divided into subcategories that the hedge funds officially follow although one needs to bear in mind that nothing prevents the hedge fund manager to alienate from the chosen strategy.

Figure 3: Hedge fund strategies



Percentages represent the portion of the CSFB/Tremont hedge fund universe allocated to each strategy as of June 2004; 11.8% of total hedge fund assets were classified as multi-strategy.
Source: Credit Suisse First Boston Tremont Index LLC.

It is often essential for a hedge fund manager to keep his asset allocation secret in order to avoid other hedge funds going after the same arbitrage opportunities Figure 3 illustrates one categorization of hedge fund strategies.

2.5 Portfolio allocation with hedge funds

Liew and French (2005) argue that alternative investments have historically benefited traditional portfolios in the following two ways:

1. Reduction of risk through diversification
2. Consistent returns

Before the emergence of hedge funds, an investor who wanted alpha had no choice but to also take beta, the market exposure, that came along with it. As the asset management industry has evolved, investors increasingly have been able to access beta exposure easily and relatively inexpensively by, for example, index tracking funds, ETFs and derivatives. The portfolio allocation decision whether to include hedge funds or not, is still a rather complex issue as the return distribution of hedge funds differs strongly from that of the traditional asset classes and hedge fund exposures are not reported publicly.

Traditionally the portfolio selection models are based on the Nobel winning work of Markowitch (1952). In these models the optimal portfolio allocation is reached when the mean-variance ratio is minimized. Furthermore an investor should choose her allocation weight from the efficient frontier where no additional expected return can be gained without increasing the risk of the portfolio. As hedge funds are seen as market neutral vehicles that do not correlate with equity or fixed income markets, the mean variance optimization strongly favours them from other investment vehicles due to the lower aggregate volatility of the portfolio.

The simple case example below illustrates the positive impact of hedge funds in the investment portfolio when the investor applies a mean-variance approach in her portfolio allocation. These kinds of examples are widely used in the markets, to sell the idea of including expensive alternative instruments into investors' portfolios.

Table 1: Portfolio allocation with and without hedge funds 2002-2006

This table illustrates the return and volatility figures of a hypothetic pension fund 1 that would have invested passively 60% of its assets in SP500 index and 40% in Dow Jones Corporate Total index between 2002 and 2006. Pension fund 2 has followed the same allocation but also in addition invested 20% of its assets in market neutral hedge funds whose performance have been proxied by CSFB/Tremont Market neutral hedge fund index. As it can be seen pension fund 2 outperformed its peer. It is good to note that the case example takes place during a period in which the markets were also coming down, which made the market neutral hedge funds lucrative investment vehicles. The source of the data is Bloomberg for Equity and Fixed Income indices and Credit Suisse for the hedge fund index.

		Annual	Annual	Sharpe	Correlations		
Investments		**Return**	**Volatility**	**Ratio**	**Stocks**	**Bonds**	**HFs**
Stocks (SP500)	S	6.19%	12.40%	0.31	1.00		
Bonds (Dow Jones Corporate Total)	B	-0.06%	6.41%	-0.37	0.03	1.00	
CSFB/Tremont Market Neutral Index	HF	7.64%	1.88%	2.83	0.03	0.02	1.00
Pension fund 1 PF = 0.6S + 0.4B		3.69%	7.95%	0.17			
Pension fund 2 = 0.8PF + 0.2HF		4.48%	6.38%	0.34			

The Markowitch model excludes the higher moments of the return distribution and assumes that investors are equally averse to deviations above the mean as they are to deviations below the mean. A profound analysis on the correct portfolio optimization method is way out of the scope of this thesis and more information on the topic can be found, for example, from Cremers et al. (2005).

2.6 Historical performance of hedge funds

Over the last years, various studies have claimed that hedge funds are less risky investments than equities, especially when the S&P500 index is used as a proxy [see e.g. Agarwail and Naik (2000), Amenc and Martellini (2003)]. The majority of these studies used the volatility of the monthly returns to measure risk and the Sharpe ratio[5] to measure the risk-adjusted performance of the fund.

As Table 2 illustrates, most of the hedge funds seem to have lower risk (volatility) than the equity markets (S/P500 and MSCI World), with which they also correlate very little. The combination of similar returns and lower risk, coupled with low correlation, has acted as a prevailing rationale for investing in hedge funds.

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5 See section 6.1.2 for more information on the Sharpe ratio and its disadvantages in hedge fund research

Table 2 Risk and correlation of Hedge Fund Indices, Jan 1994 – Jun 2004

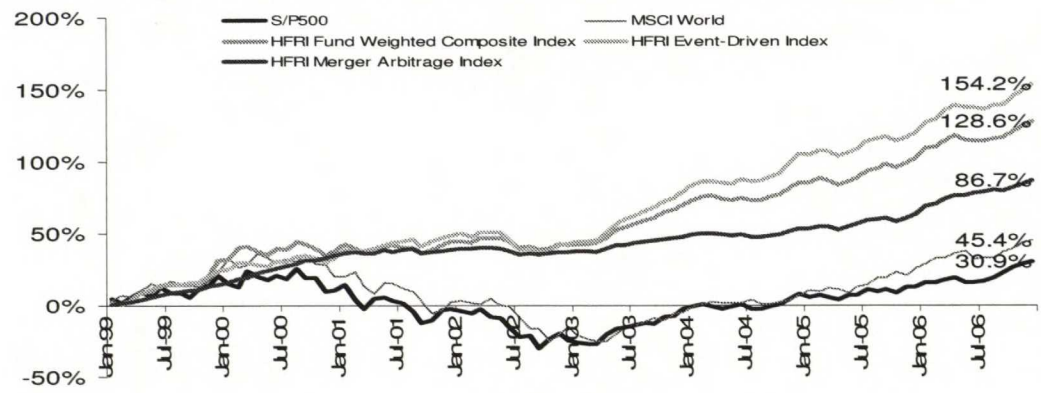
The table is copied from Tran (2006);"Evaluating Hedge Fund Performance". General hedge fund strategies and MSCI World Equity Index are tested against the Standard & Poor's 500 Equity Index (S/P500) to find correlation and beta with S/P500 that is generally been used in the studies as a equity benchmark of the U.S. equity returns. The purpose of the table is to illustrate the hedging capability that hedge funds can offer to an investor having large equity exposure in her portfolio. The Table has not been modified by the author of this study.

Index	Annualized Standard Deviation	Correlation*	Beta*
S/P500	15.5%	1.00	1.00
MSCI World Index	14.4%	0.94	0.86
CSFB/Tremont Hedge fund Index	8.3%	0.47	0.26
Convertible Arbitrage	4.7%	0.12	0.04
Dedicated Short Bias	17.7%	-0.76	-0.86
Emerging Markets	17.4%	0.48	0.54
Equity Market Neutral	3.0%	0.40	0.07
Event Driven	5.9%	0.55	0.21
Distressed Securities	6.8%	0.54	0.23
Multi-Strategy	6.2%	0.47	0.19
Risk-Arbitrage	4.4%	0.44	0.13
Fixed Income Arbitrage	3.9%	0.03	0.01
Global Macro	11.8%	0.23	0.19
Long/Short Equity	10.8%	0.58	0.41
Managed Futures	12.3%	-0.21	-0.16
Multi-Strategy	4.5%	0.06	0.02

* Against S/P500

In addition to the findings of previous studies, I calculated the cumulative returns of three Hedge Fund Research Institute (HFRI) Indices and compared those with the cumulative returns of the S/P500 and MSCI World Indices from January 1999 to December 2006. Figure 4 illustrates how the cumulative returns of the hedge fund universe over-performed the equity markets under the test period. It is very probable that the reason for this lies in the downward slope of the markets as they suffered from the so called technology bubble. When the general stock markets went down, the hedge funds were still generating positive returns as they had low correlation with the markets. Hedge funds gained positive returns during the bear markets, which justified their existence.

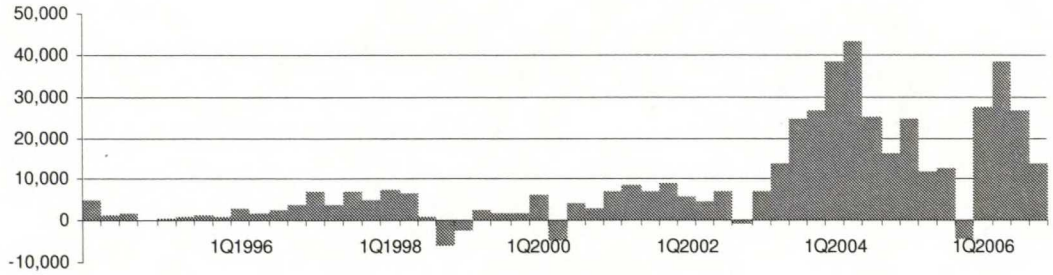
Figure 4: Cumulative returns of selected indexes 01/1999 – 12/2006



Cumulative performance of some Hedge Fund Research Institute indexes and two of the main Equity indexes. Sources: Hedge Fund Research Institute (for the HFRI indexes), S/P500 and MSCI World Factset

The rising interest in hedge funds during the previous decade is easy to spot in Figure 5, which illustrates the asset flows into the hedge funds that report to the TASS database.

Figure 5: Asset flow ($ m) to the hedge funds reporting to TASS database



Source: Lipper TASS Asset Flow Reports Hedge Funds Fourth Quarter 2006. Note that these figures represent only part of the assets under management in hedge funds universe. Please note that Figure 1 on page 10 reports the growth in asset under management.

2.7 The impact of size on hedge fund performance

Until recently, studies on the effect of fund size on hedge funds' performance have been relatively challenging to conduct due to the lack of reliable data. Clark (2003) study the possible effect of fund size on its performance with mutual funds. After comprehensive testing on various holding periods, he concludes that size does not matter as he is not able to find significant return differences between large and small funds. Unlike mutual funds, the performance of hedge funds derives from exploitable arbitrages that the skilled manager is able to identify. As fund size grows a manager might find himself in a situation where additional investment ideas are needed to maintain the required performance.

Several studies have shown that the impact of size influences hedge fund performance. Edward and Caglayan (2001) argue that hedge fund performance increases at a declining rate as fund size increases. This provides evidence that there might be an optimal size for hedge funds. However, a study by Hedges (2003) conclude that smaller funds outperform larger funds and that mid-sized funds perform worst. This phenomenon is explained by the concept of a mid-life crisis where the organization of a hedge fund does not improve at the same speed as the amount of assets under management.

While smaller funds tend to outsource certain functions to presumably leading service providers and larger, institutionalized firms have top tier processes, mid-sized firms tend to be in limbo in terms of the opportunities and processes required to attain optimum performance. Another study by Getmansky (2004) also examines the optimal asset size

for hedge funds. Contrary to Hedges (2003) she finds that the relationship between current returns and past assets is concave. She argues that for hedge funds using investment styles that invest in illiquid products or have limited investment opportunities an optimal asset size can be calculated.

The impact of size on hedge fund performance is especially interesting to activist hedge funds. Clifford (2007) argued that hedge funds have an advantage as shareholder activists, because they are able to launch a bid to purchase their target firm in case management does not answer their demands. In order to be successful in the activist campaign, the shareholder activist is required to have a sufficient amount of assets to operate and thus the smallest funds have a limited amount of investment targets.

Goetzmann et al. (2003) studies the relationship between fund flows and past performance of hedge funds and reports that new money flows out of the poorest performers to managers that have proved their skills. It can be expected that managers with greater proven skills receive the greatest money inflows and have the biggest funds. Thus, larger funds should outperform smaller hedge funds in long run.

2.8 Risk framework for hedge funds

Holton (2003) argues that risk involves two essential elements: exposure and uncertainty and that risk means exposure to a proposition that is uncertain. For understanding the risk framework of hedge funds, I have categorized different risk that hedge funds bear in Table 3. To retain the focus of the study, different risk classes are elaborated in appendix 1.

Table 3:Overview of hedge fund's risks

This table reports a framework to classify the risks that hedge funds have into groups. The risk categorization is based on the hedge fund articles that are referred in this study and is merely a practitioner's classification than a generally accepted table. The primary categories are made by Fortis Bank in 2005.

Market Risk	Asset Liability Risk	Operational Risk	Credit Risk	Legal Risks
-Security specific	-Liquidity	-Operational	-Country	
-Interest rate	-Capacity	-Human	-Counterparty	
-Directional	-Correlation	-Style Shift	-Credit Crunch	
-Greeks	-Position	-Model		
-Event	-Herding			
	-Stale Pricing			

Chapter 3. Literature review on shareholder activism

This chapter discusses about the literature on shareholder activism of both institutional investors and hedge funds. Mutual funds have legal restrictions in their maximum ownership per company to ensure adequate diversification in order to protect their investors from mismanagement. Therefore they are left out of the literature about shareholder activism. The chapter start with on overview and a framework on main theories in activism. After that the results of the studies on the target firms of shareholder activism are discussed. Then, the findings of studies on the success of shareholder activism by institutional investors and hedge funds is reported.

3.1 Overview

Shareholder activism is by no means a new phenomenon. In the early 1900s, American financial institutions such as insurance companies, mutual funds, and banks were active participants in U.S. corporate governance. Over the first three or four decades of the century, laws passed in the U.S. with the aim of limiting the power of financial intermediaries that also prevented them from having an active role in corporate governance. The Glass Steagall Act prohibited U.S. banks from having direct equity investments. The regulatory reforms that followed the stock market crash of 1929 raised the costs of investors in active participation in corporate affairs.

The consequence of such laws and regulations was a progressive widening of the gap between ownership and control in large U.S. public companies - a process that continued until the emergence of corporate raiders and leveraged buy-outs in the 1980s. The general opinion towards activism in press articles is relatively negative, as the activist are seen as greedy traders whose only interest is the maximization of their own wealth in the short-run by pumping out the assets from their target companies. Persons like Gordon Gekko became famous as the representatives of greed. The movie 'Wall Street'[6] is a good illustration of how the activists were presented to the public.

3.2 Theoretic framework

The main theories behind shareholder activism include the following three topics:

- The principal agent problem
- Agency costs associated with excess cash
- The free rider problem among investors

In publicly traded companies shareholders delegate decision-making responsibility to managers whose interests can diverge from those of their shareholders (see e.g. Jensen et al 1976). The principal agent problem takes place if the incentives of the company's management, sometimes board and investors are not aligned. This might be a situation, for example, where management is reluctant to invest resources in risky projects due to their fear of loosing their bonuses or jobs, even if that would be aligned with the interest of the shareholders. The Board of directors has a significant role in controlling such agency problems, which comes with its fiduciary obligation to the shareholders. The Board is responsible to hire, fire, compensate, and monitor the top management of the company. The demand for activism arises if a board fails to perform its task.

Jensen (1976) specifically suggests that a firm can reduce its agency costs associated with excess cash by paying out dividends to shareholders or increasing debt and interest payments to creditors. Especially hedge funds are reported to target companies that are rich in cash and short-term investments and have a low proportion of debt (Klein et al 2006).

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6 "Wall Street", 1987, Oliver Stone, Twentieth Century Fox

Faleye (2004) presents evidence in favour of shareholder activism in the form of proxy contests acting as a means of allaying the agency costs associated with excess cash. He studied a sample of 98 proxy contests between 1988 and 2000 and found that target firms hold 23% more cash than similar non-targets.

Another widely stated issued is the free rider problem among investors (Grosmann and Hart 1980) that refers to a situation where the biggest block holders are responsible for the active management and control of the company and the shareholders with smaller stakes save this time and money.

A study by Dlugosz et al., (2004) documented that in 2001 an average public company in the U.S. had an average 1.97 outside block holders with a share of over 5% in the company, who collectively owned 18% of the firm. Since the active investors incur all the costs associated with such activism while the benefits accrue to all shareholders, only shareholders with large positions are likely to obtain a large enough return on their investment to justify the costs.

3.3 Target companies

Karpoff (2001) reported that shareholder activism of institutional investors generally targets large firms with poor stock and operational performance. It seems that as hedge funds are generally interested in operationally healthy companies that just need a boost for growth as their current targets are different from the ones that the institutional investors believes to be more profitable.

Klein and Zur (2006) reported that targets of hedge fund activists do not show significant improvements in accounting performances in the year after the initial purchase but, instead, they find out that activist hedge funds pursue to extract cash from the firm through increases in the target's debt capacity and higher dividends.

3.3.1 Value stocks as target?

Clifford (2007) and Brav et al. (2006) suggest that activists target "value" firms, which have higher operating performance (relative to their passive holdings), but lower stock market performance and market to book ratios in the year leading up to the block. As the basic idea of activism is to identify companies that are undervalued and whose value can be boosted in the short time the linkage with so called value investing is clear. In order to understand the basis beyond value investing this chapter summarizes some of the main studied made in this field. The results from the academic studies have formed the basis for investment strategies that are widely applied in equity markets and traditional asset management industry.

The wide interest towards value investing can be traced back to a study of Fama and French (1992). They questioned the explanatory power of the classical Capital Asset Pricing Model (CAPM) and illustrated that the performance of the stock can be explained more accurately by its book-to-market and earnings-to-price ratios. They reported that the so-called "value" stocks with high book-to-market ratios outperformed the "glamour" stocks with low book-to-market ratios by 1.53 percent per month. The results were controversial as they were against the general "truth" that a higher level of expected return should also increase the level of risk of an investment. Lakonishok et al. (1994) confirmed the findings of Fama and French and provided more support for value investing. They studied how the stock's cash flow to price and past growth in sales affect its valuation and pointed out that the portfolio of "value" stocks, where these ratios are low, out-perform the "glamour" stock portfolio by 7.8 percent per year, or 8.7 percent on a size-adjusted basis. They also pointed out that the differences in returns are not accompanied by notable differences in traditional risk measures as beta or volatility in returns.

But what makes value stocks under-priced and so attractive targets for the hedge fund activism? Schleifer (2000) argues that investors may tend to use simple decision-making rules by assuming long-time persistence in the growth rates of the companies' earnings, cash flows and sales, and extrapolate past performance too far into the future.

Chan et al. (2002) reports that the "glamour" companies have out-shone their counterparts in the terms of past growth and that the projections of their future growth create a favorable sentiment for them. It is good to bear in mind that analysts following the companies have self-interest in recommending successful stocks in order to generate trading commissions and investment banking business for their employers. Lakoshnikov et al (1992) point out that for an investment professional it is easier to concentrate on companies that have more research and media coverage. As "glamour" stocks often come from more existing industries like IT, and so "growth" stocks often lack general interest and remain under priced relative to their fundamentals.

Does persistence in growth exist? It is commonly assumed that the book-to-market ratio measures the firm's growth opportunities relative to its accounting value and so a low ratio indicates investors to expect high growth compared to the company's value in place. In case the expectation is correct, there should be a negative association between the book-to-market ratio and realized growth. Chang et al. (2002) ranks stock into deciles by growth in income before extraordinary items over a five-year horizon. They find that stocks that have high valuation ratios usually do not meet investor's hopes and estimates. On the other hand, they report that the ex post book-to-market ratio tracks growth closely which illustrates that investors are quick to change into companies with high past growth and punish companies with the lowest realized growth.

As investors are trading more "glamour" stocks, their volatility should increase and thus raise the risk level that the investor is exposed to. La Porta et al. (1997) studied the effect of earning announcements between "value" and "glamour" stocks and provide evidence that they are significantly more positive to the "value" portfolio. This indicates that errors in the expectations explain, at least partly, the over performance of the "value" stocks with glamour ones.

The presented research shows that investors are more attracted to stocks with high past performance and high coverage. The less attractive value stocks are left as interesting targets for an activist hedge fund.

3.4 Activism of institutional investors

There is a wide amount of studies on the success of shareholder activism by institutional investors. Activism by institutional investor shows overall positive but insignificant effects on the valuation of the target company. Del Guercio and Hawkins (1999) analyse a small number of firms targeted by CalPERS[7] in the period from 1987 to 1993 and document short-run returns that are not reliably different from zero. Gillan and Starks (2000) reported similar findings for corporate governance proposals by institutional investors. Partnoy and Thomas (2006) find out that institutional shareholder monitoring has had some success, but never had the kind of impact that was really sought. They reported that institutional investors faced collective action problems, as well as agency costs and conflicts of interest within their own organizations.

Hotckiss and Moordian (1997) examined so called vulture investors that target financially distressed firms. They are able to show that improvements in operating performance of the target company are strongly related to the level of aggressiveness of the activism. Institutional investors are likely to face conflicts of interest (such as politically motivated agendas), especially in the case of pension funds, that effectively limit their possibilities for claiming improvements in the operational effectiveness of the target company.

3.5 Recent changes in hedge funds' performance – drivers of activism

Loyes and Fransolet (2005) studied several well-known arbitrage strategies, especially with fixed income, and concluded that as a result of the impressive growth of the hedge fund industry in the last decade, market opportunities have been eroded. The study offered a fresh point of view, as the writers were not concentrating on the performance of the funds or their indexes but directly studied the existence of arbitrage in the markets. To link the erosion of opportunities with the increase in the number of hedge funds, they pointed out that arbitrage opportunities have been decreasing mostly in the areas where (a) most hedge fund activity is known to be, (b) the hedge funds are employing ample capital and (c) the same trading rule(s) have been used for a while.

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7 The California Public Employees' Retirement System) is one of the biggest institutional investors in the world.

As the increased demand for hedge funds has led to an increase in their number, the study by Fung et al. (2006) points out that 'even successful hedge funds have experienced a recent, dramatic decline in risk-adjusted performance'. Several papers (e.g. Citigroup's report in 2005 and Klein et al., 2006) have pointed out that the increased competition in the traditional arbitrage strategies has forced hedge funds to search for new sources of returns.

The diminishing alpha on a known investment strategy is not a new phenomenon in the finance industry. There are a number of examples showing how superior strategies have been historically fleeting when the number of investors implementing them has increased. Siegel (2003) argues "High-beta stocks beat low-beta stocks until 1964 when William Sharpe discovered beta; and small stocks beat large ones until Banz and Reinganum discovered the size effect in 1979".

Gatev et al. (1999) studied the historic performance of pairs trading [8] in the period of 1962-1997 and found annualized excess returns of up to 12. The interesting point in their findings is that "pairs trading" has declined in profitability dramatically from the 1970s and 1980s to a low point at the end of our sample when the returns were sometimes negative. They hypothesize based on this finding that increased competition has decreased profitable opportunities.

To be able to meet the expectations of their clients on continuous positive absolute returns, hedge fund managers are expanding their investment scope and entering into new areas of exploiting arbitrage in the traditional markets. The phenomenon is similar to other industries, where companies are required to develop their operations and launch new type of products in order to keep up with the current state of the industry's life cycle.

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[8] The idea of pairs trading is the following: Competitors in the same sector are often correlated in their day-to-day price movements. When the correlation breaks down, i.e. one stock trades up while the other one is traded down, the pairs trader sells the outperforming stock and buys the underperforming one, betting that the "spread" between the two would eventually converge.

A direct quotation from Klein et al., (2006) concludes the current nature of the markets: 'Prior to 2000, hedge funds typically profited from the manager's ability to identify and capture transitory trading opportunities, primarily through arbitrage trading (Goetzmann and Ross, 2000). However, the growth of the hedge fund industry over the last few years has made it more difficult for managers to identify and exploit these arbitrage opportunities. Hence, many funds have turned to an alternative strategy – hedge fund activism.

3.6 Activism of hedge funds

As hedge funds have been looking for new areas to invest in, there have been some changes in the environment that has helped them in moving to shareholder activism. Brigs (2006) notices that some legal reforms (SEC rules, Securities Act, Exchange Act) recently have taken place in the U.S.A. that have deregulated proxy contents and so made it easier for hedge funds to attack the management of a target company. Nathan and Lopez Sr. (2005) also report that the general attitude among investors towards shareholder activism has changed due to several scandals (of which the most famous is Enron) that have pushed shareholders to put more effort in compliance regulations.

Also management is held responsible for poor performance or other negative issues concerning the company by the investors. Hedge funds have emerged as aggressive shareholders of many firms in recent years. In general, they first identify a company that they see as undervalued and investigate how its value can be increased. After having found a viable method, the hedge fund starts increasing its exposure on the target company. This is preferably done in silence so that the share price does not get affected, allowing them to acquire more shares as cheap as possible. Once the hedge fund has a significant stake in the company, it starts to demand changes in the company's policies or strategy. The fund attempts to attract attention and publicity to the company and the fund's ownership of the stock. The public pressure and media attention allows the fund to pursue its objectives more vigorously in order to raise the market value of the company. In general, the activists pack their biggest punch at small companies at which their investments translate into large voting blocks. However, no companies are save from activist hedge funds as recent cases with giants like General Motors, ABN Amro, McDonald's, and Time Warner facing activist attacks illustrate.

A unanimous U.S. based activist hedge fund describes its strategy in its sales brochure as following: "...Our fund applies private equity governance and business building methods to public companies where we are trusted partners and CEO allies. Our "positive activism" targets small to micro cap companies that offer core investments with low correlation to major indices, tax efficiency, board representation, and compelling organic growth.."

Case studies on hedge fund activism have identified the following categorization of demands that activists hedge funds claim in order to increase the value of the target company. In practise "positive activism" means:

- Seeking a board seat (to enable future changes in the target company)
- Sale or spin off of a part of the company (especially often real estate assets)
- Large cash payment to the shareholders in the form of a special dividend or a share repurchase (agency cost of excessive cash)
- Increase of leverage
- Challenge on going mergers or acquisition
- Encourage the target company to be sold or to take over another company

The current level of research on the performance of activist hedge funds is relatively scarce and covers mainly the market reaction on the activism and its impact on corporate governance. Even if the quantity of research is rather limited, it seems to be in line with the media headlines and statements indicating that activists efforts have proven to be rather successful and have out-performed market returns.

One potential measure of the effects of shareholder activism is whether the announcement of such activism is accompanied by an increase in the company's value. This kind of study analyzes whether other investors change their expectations of the value of a firm because they believe that activism will lead to real economic changes. To measure such an increase, researchers commonly conduct an event study where they examine changes in stock prices around the date of the announcement of any activism. Table 4 presents a selection of the studies on the market impact of the hedge fund activism.

Table 4: Selected Studies on the Market Reaction to Hedge Fund Activism

This table presents the findings of five selected event studies on the market reaction to an activist hedge fund's announcement on the purchase of their target company and demands for changes in its strategy, management or capital structure
CAR = Cumulative Abnormal Return
13D = The Securities Exchange Act of 1934 provides that any shareholder who accumulates 5% or more of a single security must file with the SEC thereby disclosing their block holding. If the investor is unwilling to attest that they will not affect the control of the firm or its management, they must file the form 13D within 10 days from crossing the 5% threshold.
Hermes UK Focus Fund is part of the Hermes Group, an investment management group owned by the British Telecommunication Staff Superannuation Scheme8. Hermes manages the assets of the BT Scheme and the Post Office Staff Superannuation Scheme, two of the largest four pension funds in the UK. In addition since 1997 Hermes has been offering management services to third party clients. In March 2006 Hermes has £61 billion under management

Paper	Sample	Result
Citigroup (2005)	Event study. 31 U.S. companies targeted between June 2004 and June 2005	~5% for non M&A activism and 8% CAR on announcements date
Brav el al (2006)	374 event of activist hedge funds 2004-2005	CAR of 4.2% (t=6.6) over a [0,+10] window surrounding the notification
Becht et al. (2006)	41 investments of Hermes Focus Fund between October 1, 1998 and December 31, 2004.	CAR of -2.66% (t=-2.48) over a [-5,+5] window surrounding the notification
Klein and Zur (2006)	136 cases of Activist (form 13D) in U.S. 2003-2005	Size-adjusted CAR of 7.3% over the [-30,+5] window, and 10.3% over the [-30,+30] window.
Clifford (2007)	197 activist hedge funds 1998-2005	Average CAR of 3.44% over the [-2,+2] window

Another important aspect of hedge fund activism is parallel investing, which is often referred to as wolf-pack strategy. In the wolf pack strategy activist hedge funds cooperate in a similar way to the herd of wolfs or the German U-boats in the Second World War. Individually they acquire relatively small stakes in the target company's stock and act together in challenging the management when they assume that the aggregate holding is large enough. The big advantage of the parallel investing is that it enables hedge funds to avoid certain "poison bills"[9] as there is not a single external investor that is pursuing to gain more control in the target company. Nathan and Lee (2006) also report that several activist hedge funds take follow-on position in other fund's initiatives as target companies.

[9] Poison pills are often used to avoid takeover bids. Takeover bids are attempts by a potential acquirer to obtain a controlling block of shares in a target company, and thereby gain control of the board and, through it, the company's management. There are several types of "poison pills" that can be planned by the management of a company that thinks it may be the target of a takeover by a potential acquirer, but the conventional poison pill is now a shareholder rights plan. (definition by Wikipedia – http://en.wikipedia.org)

3.7 Hedge fund as activists

Hedge funds differ from pension funds and shareholder groups if it comes to activism opportunities. The hedge fund manager's ability to earn performance-based compensation, lock-up investor capital, and the use of leverage and options to increase effective ownership stakes may increase the incentives and possibilities of the hedge fund manager to monitor and affect strategy at the target firm through the exercise of significant bargaining power over firm management. Furthermore they often have the ability to ultimately acquire the target firm if management and/or the board does are against their demands. Clifford (2007) studied the campaigns of 197 different activist hedge funds between 1998-2005 and identified 29 cases where the hedge fund launches a bid to acquire the target firm.

From the investors' point of view, the following two issues have to be taken into account when analysing the benefits that an activist hedge fund offers:

- Exposure to equity markets
- Costs of activism

Successful activist campaigns may require funds to hold large, illiquid blocks for extended periods of time. Hedge funds are reported to routinely use leverage and options to gain increased effective ownership in target firms (Hu and Black, 2006). Due to the long holding period, activist hedge funds are exposed to the markets through their investments, as they are not able to exit fast without a market reaction[10] from the target company. The combined long-term exposure to the stock and the exposure to the event risk of the success or failure of the activist campaign offers an interesting field to study and makes the "hedging" that the fund offers questionable.

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10 Market reaction here refers to a situation where the hedge fund would need to sell its stock with discount as the markets don't offer enough short-term demand for a big block of ownership in the target company.

Mitchell and Pulvino (2001) compared the returns of a theoretic risk arbitrage strategy that invested in merging companies with a model that mimics the results of a hypothetical risk arbitrage manager. They concluded that not accounting for transaction costs and other practical limitations, such as liquidity problems and price effects if large amounts of stock are traded at once, is the primary explanation for the large excessive returns reported in previous studies on risk arbitrage trading. As hedge funds act as initiators of activism, the question arises how high its additional costs are, as the other shareholders are able to free-ride and enjoy the additional returns from activist campaigns. Clifford (2007) identified six activist funds, out of a sample of 197 hedge funds that were actually reimbursed for their expenses paid in proxy battles. However, these were only the direct legal costs excluding other additional costs that activist hedge funds bear, like managerial time and effort spent, costs of disclosing information to the public, etc.

Chapter 4. Hypotheses

The purpose of this chapter is to present the hypothesis that are tested in this study. The hypotheses are based mainly on the findings of the existing literature reviewed. Section 4.1 formulates hypotheses relating to the performance of the activist hedge funds when compared with funds using other strategies. Section 4.2 presents hypotheses about the observable market risk factors explaining the performance of the activist hedge funds. Section 4.3 includes the hypotheses on the impact of the activist hedge fund's size on its performance.

4.1 Performance of activist hedge funds

As picture 1 on the page 10 illustrates, the hedge fund industry has experienced a dramatic growth both in assets under management and number of hedge funds. Many studies, such as Loyes and Fransolet (2005), have conclude that as a result of the impressive growth of the hedge fund industry in the last decade, market opportunities have been eroding. As the changes in the competitive environments has made it more difficult for managers to identify and exploit these market arbitrage opportunities. Activist hedge funds as a new strategy should be able to outperform the funds concentrating in traditional strategies and so I expect that:

H1: Activists hedge funds offer higher returns than hedge funds in general
H2: Activist hedge funds offer higher abnormal returns (alpha) than hedge funds in general

4.2. Market risk of hedge funds

As no study before has studied the performance of activist hedge funds, the exposures that this strategy have with common markets are not known. In their recent working paper, Boyson and Mooradian (2007) investigate 418 separate activist effects over the period of 1994 to June 2006. They pointed out that the average target firm is relatively small in size, has poor recent stock performance and low growth opportunities that can be identified by large cash positions, high book to market ratios and low Tobin's Qs. The target firms can be classified as cash cows in the BCG matrix as they have strong operating performance measured by return on assets and cash flow as percentage of assets. It seems obvious that these targets seem to suffer from the agency costs of free cash and the reluctance of current management to enter new projects bearing higher risks. I assume that:

H3: Activist hedge funds offer hedging to their investors in a form of low correlation with the general equity indices
H4: Performance of the activist hedge funds can be explained by the performance of stocks with low book-to-market ratio
H5: Performance of the activist hedge funds can be explained by the performance of small capitalization stocks
H6: Changes in credit spread affect the returns of activist hedge funds

4.3. Impact of hedge funds size

As the thesis is first of a kind to test the characteristics of activist hedge funds there is no existing literature on the impact of size to their performance. Based on the literature review on impact of size presented in section 2.7. I draw the following hypothesis on the impact of size to hedge fund's performance:

H7: Returns of the activist hedge fund increase along with an increase in fund size

H8: The largest activists are less risky

H9: The largest activists hedge funds have higher alphas

The eight hypothesis is based on assumption that larger the activist hedge fund is more possibilities it has for diversify its risks among several independent target companies.

Table 5 below summarizes the research hypotheses.

Table 5:Research questions
This table summarizes the research questions of the thesis.

H1: Activists hedge funds offer higher returns than hedge funds in general
H2: Activist hedge funds offer higher abnormal returns (alpha) than hedge funds in general
H3: Activist hedge funds offer hedging to their investors in a form of low correlation with the general equity indices
H4: Performance of the activist hedge funds can be explained by the performance of stocks with small book-to-market ratio
H5: Performance of the activist hedge funds can be explained by the performance of small capitalization stocks
H6: Changes in credit spread affect the returns of activist hedge funds
H7: Returns of activist hedge funds increase along with an increase in fund size
H8: The largest activists are less risky
H9: The largest activists hedge funds have higher alphas

Chapter 5. Research data

This section begins by describing the characteristics of the data used in the thesis. After that the factors used in hedge fund style model and asset based model are discussed. Finally the linear and quadratic regression models used to test the hypotheses on the impact of activist hedge fund's size on its performance are presented.

5.1 Data

Most academic research on hedge funds relies on commercial databases such as AltVest, Hedge Fund Research (HFR), Managed Account Report (MAR) and Tremont TASS Managements Limited, that has recently been sold to Lipper. In this study the TASS database is used as data source on activist hedge funds because previous research (e.g. Liang, 2000, 2001), has revealed TASS to be the most comprehensive and accurate hedge fund database. Table 5 illustrates the composition of the TASS database by the strategies that the funds self-claim to follow. The sample period is January 2002 – December 2006. This period was selected as shareholder activism by hedge funds is a relatively new phenomenon and in this way more data was available for the study.

Table 6:Hedge fund strategies in TASS
This table illustrates the structure of TASS database per December 2006 by the strategy that the hedge fund reporting to TASS claims to follow

Strategy	Portion of funds by Net Assets	Portion of funds by their number
Long/Short Equity Hedge	27.0%	29.6%
Event Driven	15.0%	8.1%
Multi-Strategy	6.7%	3.9%
Fixed Income Arbitrage	5.5%	4.3%
Global Macro	3.9%	3.8%
Emerging Markets	7.2%	5.3%
Equity Market Neutral	3.5%	5.3%
Managed Futures	4.1%	5.6%
Convertible Arbitrage	2.6%	2.5%
Dedicated Short Bias	0.2%	0.5%
Fund of Funds	24.3%	31.1%

5.2 Biases

It is generally accepted that hedge fund data from the commercial databases is exposed to several biases. A detailed analysis on these biases can be found e.g. in Fung and Hsieh (2000). These biases must be taken into account when analyzing the empirical results. The hedge fund database used in the study contains the following biases:

- **The selection bias** is a result of the lack of reporting requirements of the hedge funds. It is questioned whether the databases represent the market portfolio of the hedge fund universe as only part of the existing funds are included in the database.
- **The survivorship bias** occurs when the database includes only funds that are operating and omitting funds that have liquidated or stopped reporting their returns to the data vendor for some other reason. It can be assumed that a sample of alive funds publishes different results than a sample from the universe. Thus the database is claimed to be biased. To correct the bias, TASS has stored funds that stop reporting in the graveyard database since 1994.
- **The instant history bias** exists because of the data collection method of the database. When a new fund is included into the database, its past performance history is backfilled from the start of the investments. As funds with lucrative performance have a higher incentive to join the database than funds with poor performance the return data is biased upwards when compared with the hedge funds universe.

It is not clear which direction the selection bias would take for activist hedge funds. On the one hand, when the names of activist hedge funds in TASS are compared with those in the newspapers, it is clear that quite a few generally big activist funds do not report to the TASS database. As articles about activist funds get into the newspapers quite frequently, one might assume that they do not need the advertisement of a database and have less incentives to report their returns to these databases. If this would be the case, the selection bias of activist hedge funds might be contrary to the normal situation as the used data is biased downwards. On the other hand, if activist hedge funds that are not successful with this strategy either liquidate before they start reporting or change their strategy, the bias might be upwards. This study pursues to decrease selection bias by adding three additional large activist hedge funds that do not report their returns to the database.

TASS database moves the funds that stop reporting to a "graveyard" database. In order to correct for the survivorship bias this study includes also activist hedge funds in the "graveyard". This study includes only hedge funds with a minimum sample of one year of returns to diminish the effect of the instant history bias.

5.3 Activist hedge funds

The TASS database does not distinguish hedge fund activism as a strategy. Fortunately the database captures shareholder activism as an investment focus. The performance data of the activist funds is collected in three different ways.

First method

The first selection method is to select all the hedge funds that claim to have shareholder activism as an investment focus. In order to clean the data, all funds of funds and hedge funds having another investment strategy than event driven, long/short equity hedge, equity market neutral and emerging markets were extracted from the sample. As hedge funds often have clones in different currencies on new series with the same strategy, only funds in USD were included. Also a check was made to eliminate funds that have partners with a similar name. All the funds were required to have reported both monthly performance and net asset values to be included in the sample.

Table 7: Hedge Fund Selection (TASS investment focus)

The table reports the process used to construct data on hedge funds that self-claim to focus on shareholder activism. Source of the data is TASS database including both live and graveyard funds. Sample period is January 2002 – December 2006 (both months included).

Criteria	Add (+) / Delete (-)	Number funds
Investment focus "Shareholder Activism"	+	280
Investment strategy "Fund of Funds"	-	176
Investment strategy "Multi-Strategy"	-	6
Currency other than USD	-	15
Less than 1 year of performance data on the sample period	-	7
Missing monthly data	-	11
Total		65

It is important to notice that by claiming to follow shareholder activism a fund of funds merely retains a possibility to hold activist funds instead of launching own activist campaigns.

Second method

Euromoney magazine interviewed several activist hedge fund managers in its February 2007 edition and one of the practitioners told that the fund run into problems just by having the word "active" on their website. They had to change it to the word "ownership", because a lot of people who call themselves active have left a bad taste in management's mouth.

Many activists thus denote themselves as belonging to some other, more comprehensive category and don't want to advertise themselves as being an "activist". Another issue to take into account when gathering data on activist hedge funds is that when a fund enters the database and fills in the strategy, it might not have yet been an activist fund. Due to these two reasons, activist funds might not be classified as activist in TASS.

In order to spot these activist hedge funds a list of activist events of hedge funds was gathered. The sources for this information were previous academic papers on activism, business magazines and newspapers through LexisNexis news service. This methodology resulted in 25 hedge funds that are tagged as "TASS (event of activism)".

Third method

As some of the largest and most famous activists do not have any incentive to report their performance, it is challenging to get this data and include it in a public research. In order to improve the accuracy and reliability of the data, an institutional investor provided the additional figures for three main activists: Carl Icahn; Steel Partners; and Cherry Three. To meet the confidentially requirement, the assets and performance figures of these fund are included on an aggregate basis in the whole sample.

The three applied data gathering methods result in a sample of 92 activist hedge funds. The structure of the data is reported in Table 8. Hedge funds that self-claim to be activists are the smallest ones in the sample. The ones that are included in TASS but not as activist are generally larger in size and the additional three hedge funds that do not report to TASS are the largest.

Euromoney's article "The real face of activism" (February 2007) estimated the number of dedicated activists to be 125 thus the sample size can be seen to be comprehensive.

Table 8: Activist funds sample per selection method

This table summarizes the number of activist hedge funds included in the sample of this study be different selection methods. The figure in parenthesis shows the portion out of the total amount. "TASS investment focus" refers to the funds that self-claim to be activists, "TASS (event of activism)" are the funds that don't claim to be activists but have been involved in an activist effect during the sample period, "Additional funds" are the large activist hedge funds who don't report to TASS but whose performance figures were able to have for this study.

Method	Number of funds		Net Assets per December 2006 ($ Billion)	
TASS (investment focus)	65	69%	10,2	16%
TASS (event of activism)	24	28%	37,7	59%
Additional funds	3	3%	15,9	25%
Total	92	100%	63,8	100%

Table 9a: Descriptive Statistics

The table reports the descriptive statistics of the different sample groups. N refers to the number of monthly return observations that the category has. Mean refers to the arithmetic average of the monthly performance returns and median to their median. Volatility is the standard deviation of the returns and max and min the highest and the lowest value in the sample period of January 2002 – December 2006. Skewness and kurtosis are the higher moments of the whole return distribution inside the sample category and used to measure the symmetry and the peakness of the return distributions. The source of the returns for the first two categories is the TASS database and for the category Outside TASS the ones that the funds have been reported to their investors. All the return are net-of-fees and have been reported in USD.

	TASS (investment focus)	TASS (event of activism)	Additional funds
N	2584	1290	102
Mean	1,27%	1,04%	1,73%
Median	1,03%	0,89%	1,32%
Volatility	4,26%	2,60%	2,69%
Max	47,97%	24,4%	9,54%
Min	-65%	-18,96%	-4,8%
Skewness	-0,02	0,26	0,66
Kurtosis	34,99	13,19	0,68

Table 9b: Differences in Means

The table shows mean values of the different sample groups and corresponding two tailed t-statistics for equality of means. For each variable, *, ** and *** indicate that the value is significantly different from compared value at the 10%, 5% and 1% levels, respectively.

	Means (t)		
	TASS (investment focus)	TASS (event of activism)	Additional funds
Self-described			
Activist event	1.18		
Outside TASS	1.62	2.12**	

To be able to study the performance of the identified activist universe an asset-weight-adjusted index was constructed. It is important to notice that the index is mentioned purely for studying the performance of the hedge funds and thus differences slightly from the Global Indices like MSCI Barra products that are constructed and managed with a view to being fully investable from the perspective of international institutional investors.

As indices are often replicable the purpose of constructed activist index is to operate as a research tool in attribution of the performance of shareholder activism. The monthly return is calculated with the formula presented on the next page.

$$r_{it} = \frac{\sum r_{ft} * A_{ft}}{\sum A_t} \qquad (13)$$

Where

r_{it} is the monthly return of the index on month t

r_{ft} is the return of the fund f on month t

A_{ft} are the assets under management of the fund f at the month t

$\sum A_t$ is the aggregate amount of asset under management on month t

In the index, the weight of an individual fund is based on its assets at the end of the quarter that might affect its ex-post performance as the funds with higher performances or larger net investments are slightly over weighted. In order to measure whether this effects the outcome, Pearson correlation is measured between the two indices constructed in two different ways. Table 11 reports the findings of this test which indicates the choice of weighting between the end of the month AUM value and the beginning of the month AUM to not have an affect on the results.

Table 10: Activist funds sample per selection method

This table reposts the correlation of an activist hedge fund index where the weight of a single fund is based on the value at the end of the month and with an index where the weight is based on its value at the beginning of the month.

Correlation	0.99820
P-value	<.0001

5.4 Hedge fund indices

In this thesis I use the CSFB/Tremont Hedge Fund Indices. L'Habitant (2001) claims that these indices offer the following advantages with respect to their competitors:

- They are transparent both in their calculation and composition, and constructed in a disciplined and objective manner and include only funds that have at least US $10 million under management and provide audited financial statements.
- They are computed on a monthly basis and asset-weighted, which makes these indices representative of the various hedge funds investment styles and useful for tracking and comparing hedge fund performance against other major asset classes.
- Funds of hedge funds and separate accounts of the same hedge fund are not included, which should prevent multi-collinearity problems in the regressions made with these indices.

The intuition for using the hedge funds style indices as independent variables is that they incorporate the hedge fund specific risk factors that are not observable by traditional market factors. An underlying assumption behind a linear regression model is that the chosen factors are independent and do not correlate excessively against each other. Table 11 below reports the correlations between individual CSFB indices.

Table 11: Correlation between CSFB indices

This table reports the Pearson correlations between the different asset-weighted CSFB hedge fund indices. For each variable, *, ** and *** indicate that the value is significantly different from the compared value at the 10%, 5% and 1% levels, respectively.

	Convertible Arbitrage	Emerging Markets	Equity Market Neutral	Event Driven	Multi-Strategy	Risk Arbitrage	Long / Short Equity
Convertible Arbitrage	1.000						
Emerging Markets	0.249	1.000					
Equity Market Neutral	0.231	0.228	1.000				
Event Driven	.544*	.653**	0.037	1.000			
Multi-Strategy	.530**	.666**	0.073	.966**	1.000		
Risk Arbitrage	.391**	.590**	0.118	.734**	.710**	1.000	
Long/Short Equity	.477**	.768**	.256*	.795**	.820**	.756**	1.000

Chapter 6 Methodology

This chapter describes the performance attribution measures, regression models and explanatory factors that are used in the study. The choice of the following models is based on findings in existing literature and on the intuitive rationale behind the underlying investment strategy. All the regressions are run with the ordinary least square methodology.

6.1 Fund performance assessment

A large amount of literature exists on both quantitative and qualitative performance evaluation for investment funds. In order to obtain a broad view on the performance and risk-return characteristics of activist hedge various performance measures are applied.

The purpose of this chapter is to compare the performance of an activist index with traditional hedge fund strategy indices by using standard performance measurement tools, such as a mean-variance framework, characteristics of the return distribution, correlations and semi-deviation. Due to the special nature of hedge funds one has to be cautious when merely using traditional, often simple, measurement methods that may lead to biased results. For that reason the classical Sharpe ratio and Treynor's alpha are introduced and tested. Finally a more recent attribution method for hedge funds, Omega, is applied to finalize the chapter of attribution measurement.

6.1.1 Mean-variance framework and higher moments

A straightforward method for assessing performance is measuring the return by the mean (arithmetic average return) and the risk by the standard error, often called as volatility, of the returns. The drawback of the traditional mean-variance framework is that it assumes a normal return distribution.

Higher moments, skewness and kurtosis, are used to measure the normality of a hedge fund's return distribution. Skewness describes how asymmetric the distribution is. A positive skewness indicates that more observations are found in the right tail of the distribution. Kurtosis indicates the existence of extreme returns. The higher the kurtosis is, the higher is the likelihood of extreme results. A risk-averse investor prefers positive skewness and dislikes high kurtosis with negative skewness. Previous research (e.g. Malkiel and Saha, 2002) indicates that the return distribution of hedge funds appear to be non-normal and negatively skewed with high kurtosis.

The mathematical definitions of the skewness and kurtosis of a sample are:

$$S = \frac{1}{N}\sum_{i=1}^{N}\left(\frac{y_i - \bar{y}}{\sigma}\right)^3 \quad (1) \qquad K = \frac{1}{N}\sum_{i=1}^{N}\left(\frac{y_i - \bar{y}}{\sigma}\right)^4 \quad (2)$$

where

N is the sample size,

$\bar{y}$ is the arithmetic mean

6.1.2 Sharpe ration and Treynor's alpha

The most classical instruments for performance measurement are the Sharpe ratio and Treynor ratio. The purpose of these measures is to compare the expected return and risk of the portfolio and to enable the investor to compare the rate of attractiveness of different investments. These ratios divide the amount of expected return of the portfolio exceeding the risk-free return by portfolio's volatility (Sharpe) or beta (Treynor).

$$Sp = \frac{E(Rp) - Rf}{\sigma(Rp)} \quad (3) \qquad Tp = \frac{E(Rp) - Rf}{\beta p} \quad (4)$$

Both of the models are relatively old (Treynor 1965 and Sharpe 1966) and often too simplified for modern use. The third "classical" model that is the base for current performance measurement tools is Jensen's alpha (1968) that calculates the portfolio's additional returns.

$$R_{Pt} - R_{Ft} = \alpha_P + \beta_P (R_{Mt} - R_{Ft}) + \varepsilon_{Pt} \quad (5)$$

In his article "Sharpe Ratio" (1994) Sharpe himself pointed out that the use of the Sharpe ratio "is subject to serious questions". In order to correctly implement the Sharpe ratio in the portfolio attribution measurement investors have to understand the assumptions behind the model that are: (a) historical results have some predictive ability; (b) the mean and standard deviation are sufficient statistics; (c) returns are not serially correlated; and (d) similar investments have similar correlations with the markets.

6.1.3 Omega

Probably the most used performance-rating measure for hedge funds that incorporate the higher moments into the analysis is called Omega and was developed by Keating and Shadwick (2002). It is especially suitable for hedge funds as it facilitates strategy comparisons, especially when distributions are non-normal and skewness and kurtosis can influence investors' preferences, as is the case with institutional investors.

Omega is a ratio of the cumulative likelihood of gain versus loss at a target return. In other words, these statistics allow strategies and funds to be ranked based on the probability of meeting a target return with the least downside risk.

Omega is expressed mathematically as:

$$\Omega(L) = \frac{\int_{L}^{b}(1 - F(r))dr}{\int_{a}^{L}F(r)dr} \qquad (6)$$

Where L = the required return threshold, a and b are the return intervals, and $F(r)$ is the Cumulative distribution of returns below threshold L.

6.1.4 Semi-deviation

Investors usually prefer upside movement in the value of their investments (excluding short positions) and avert downward movements. The sole difference between Semi-Deviation and standard deviation is that only the negative deviation is included in the measurement. The formula is:

$$Semi - Deviation = \sqrt{\mathrm{E}\{Min[(R - \mu),0]^2\}} \qquad (8)$$

Where R is the monthly return and μ is the average return.

To retain the scope of the study, only a presentation of semi-deviation is included in this section. Appendix B elaborates other common risk measurement tools for hedge funds.

6.2 Factor models

Before going deeper into the performance analysis, it is important to distinguish the four major factors affecting fund performance: *strategy*, *location*, *style* and *style factor* (Fund and Hsieh 2002. Strategy tells how exposure to investments, either long or short, is reflected in the fund's objective. Location describes which assets are chosen in a fund. Style tells how the positions are managed and leveraged and style factor refers to the main style, e.g. convertible arbitrage, whose characteristics are common to many similar styles. As mentioned earlier hedge funds are not required to report their holdings and for that reason the results of the research are impossible to audit.

There is a long tradition of characterizing investment funds according to parameters estimated via a linear model of returns. A factor model in a generic mode relates a fund's returns to a linear combination of pre-specified factors in a regression equation. The regression model is suitable for explaining a manager's style and excess returns. The used style is expressed in the coefficients of used factors whereas excessive return, added by the manager's skill, is presented in the residual component and the regression intercept term. An assumption behind this model is that the factors are appropriately and exhaustively chosen and so the model explains adequately the performance of the fund.

Single factor models, like Jensen's alpha (1968) were widely used until 1992 when a major breakthrough took place when William Sharpe introduced his factor model for investment fund assessment. It was intended to be an asset-class model that reduces the variety of mutual fund styles to a model involving only a limited number of major asset classes. The elegance of the Sharpe's solution lies in its simplicity. It also provides an explicit link between investment styles and traditional asset classes, which is a key connection between the way how investment strategies are implemented (styles) and in which assets funds invest (location).

Sharpe's linear combination of asset classes can be modelled as:

$$R_t = \alpha + \sum_k b_k F_{k,t} + u_t \qquad (12)$$

Where:

Rt = Fund's return;

= the return of an asset class factor k at time t;

= the regression intercept term;

= the stochastic error term

The usefulness of the model depends crucially on the factor(s) that are chosen to explain the performance of the fund. Sharpe's original model was based on twelve asset classes that were based on three main criteria: (a) factors should be mutually exclusive; (b) factors should be mutually exhaustive; (c) factors should differ substantially from each other.

To ensure that the chosen factors build up an effective model its goodness-of-fit (measured by adjusted residual square) is ought to be high enough and it should be free from multi-collinearity (measured e.g. by VIF-test). Several techniques for factor identification have been proposed in literature. Following the suggestions of Alexander and Dimitru (2005), these techniques can be classified into the following four groups:

- The "base case" model that only has two factors: equities and bonds.
- A broad fundamental model that broadens the base case model by incorporating more factors such as foreign exchange rates, commodity indexes, price dispersion and volatility.
- The HFR model that uses hedge fund indexes as the factors.
- The PCA model that uses investable portfolios replicating the first four orthogonal components from principal components analysis (PCA) of the system of all funds' returns. This model is based on an assumption that as a group of hedge funds use similar strategies in the same markets their returns should be correlated. A drawback regarding the PCA analysis is that its implicit factors do not have a direct economic interpretation (expected the first factor that is typically highly correlated with the markets).

Ackermann, McEnally, and Ravenscraft (1999), Brown, Goetzmann and Ibbotson (2001), Agarwal and Naik (2000) and Liang (2000) use a single-factor model to estimate hedge funds' abnormal returns, or alphas. Because there is evidence that hedge fund managers are exposed to multiple rewarded sources of risk, other authors have used multi-factor models.

Fung and Hsieh (1997) use an implicit multifactor model (factors are principal components obtained through factor analysis techniques). Schneeweis and Spurgin (1999) use an explicit multi-factor model (factors are proxies for domestic and international equity and fixed-income risks, equity volatility risk, commodity risk and currency risk) to explain the returns of hedge funds.

Liang (1999) and Agarwal and Naik (2000) use an explicit multi index model (factors are return on broad-based market indices) and Edwards and Caglayan (2001) use a multi-factor model (factors are Fama-French like portfolios, including S&P 500, book-to-market, size factors, momentum-winner factors, as well as term and default factors) in their studies on hedge fund performance.

The traditional linear factor models have been claimed to offer only a limited help in evaluating the performance of hedge funds because hedge fund returns typically exhibit nonlinear option-like exposures to standard asset classes (e.g. Fung and Hsieh, 1997 and 2000, or Agarwal and Naik, 2003), which is caused by the use of derivatives and the dynamic trading strategies that hedge funds often follow.

In the literature the problem of linearity has been tried to be solved by including new repressors with non-linear exposure to standard asset classes to proxy dynamic trading strategies in a linear regression. Similar approaches have also been used to explain specific hedge fund strategies such as event arbitrage (Mitchell and Pulvino, 2001) or trend-following strategies (Fung and Hsieh, 2001).

Taken into account the characteristics of the shareholder activist strategy, (long exposures in only a few equity investments for a relatively long period as ownership building and activist campaigns usually take months) a linear model should not be as problematic as with strategies involving short selling or derivatives. An alternative candidate for repressors are hedge fund index returns that are proven to follow a non-normal returns distribution by the nature of their underlying strategy. For example, L'Habitant (2001) used this method to explain the performance of hedge funds. The second model that is being tested in this study uses hedge fund indices as explanatory variables. Table 12 summarizes the findings of the above-mentioned studies.

Table 12: Selected studies on hedge fund performance

This table presents the data and the goodness-of-fit measurements of the studies mentioned in this chapter. Database abbreviations are: TASS: Tremont Advisory Services; HFR: Hedge Fund Research Institute; MAR: Managed Account Report

Study	Data	Goodness-of-fit
Fung and Hsieh (1997)	TASS 1991-1995	$R^2 = 40\%$
Ackermann, et al., (1999)	HFR & MAR 1990-1998	Adjusted $R^2 = 24.5\%$ for 4 years sample
Schneeweis and Spurgin (1999)	TBA	Average R^2 of 31%
Liang (1999)	HFR 1990-1997	Adjusted $R^2 = 70\%$ for Emerging Markets and 0.20 for FX funds
Mitchell and Pulvino (2001)	4750 M&A Events	Adjusted $R^2 = 0.07\%$
L'Habitant (2001)	MAR,HFR,TASS 1992-10/2006	Average $R^2 = 0.56\%$
Fung and Hsieh (2001)	TASS 1987-1997	Adjusted $R^2 = 0.48\%$
Agarwal and Naik (2003)	HFR 1990 -10/1998	$R^2 = 52\%$ for Event Driven hedge funds

6.2.1 The hedge fund style model

The most straightforward way to compare the performance of activist hedge funds with the performance of hedge fund using traditional strategies is to use the general hedge fund indices as explanatory factors. The methodology has been widely used with mutual funds, as for example Daniel et al (1997) show, but it has taken a relatively long-time before hedge fund indices were introduced that are credible enough. L'Habitant (2001) is the first to apply hedge fund indices to explain the performance of hedge funds in general. He states this approach provides a useful indication to which economic environment a manager is likely to do well or poorly.

The following indices are chosen to be factors:

Convertible arbitrage

Funds with a convertible arbitrage strategy invest in the convertible securities of a company. A typical investment is to be long the convertible bond and short the common stock of the same company. Positions are designed to generate profits from fixed income securities as well as from the short sale of stock, while protecting the principal from market moves. Agarwal, Fung, Loon, Naik (2006) studied the performance of funds following a convertible arbitrage strategy and identified several equity-related explanatory factors such as volatility and exchange rate risks that have an affect on the valuation of the equity investments as well.

Event risk

This strategy could be defined as "special situations investing designed to capture price movements generated by a significant pending corporate event such as a merger, corporate restructuring, liquidation, bankruptcy or reorganization". There are three popular sub-categories in event-driven strategies: risk arbitrage, distressed securities, and multi-strategy. Event-risk funds invest mainly in equity and thus bear the same risk characteristics as the shareholder activists.

Risk (merger) arbitrage

Merger arbitrage is a sub-class of the event driven strategy category. Hedge funds following this strategy invest simultaneously in long and short positions in companies involved in a merger or acquisition. Risk arbitrageurs are typically long the stock of the company being acquired and short the stock of the acquiring company. The principal risk is deal risk, should the deal fail to close.

6.2.2 Asset based model

Asset based models offer more comprehensive insights to the risk exposures that shareholder activists bear. Thus they play an important role in investment decisions where investors compare additional risk exposures with the current exposures they have in their portfolios.

In addition to the broad equity index, I use the classical Fama and French factors to improve the explanatory power of the model. Since Fama and French published their findings on the effect of size and book-to-market ratio on the stock performance, their benchmark factors have become widely used in literature explaining the performance of hedge funds as Kenneth French offers the data on his website[11] for free. Together with the Fama and French factors, returns of investing in momentum and credit spread are included in the model, as those have been reported to explain the performance of hedge funds. As the sample includes only U.S. based hedge funds, apart from the equity index, all the other variables are based on returns data of stock listed at NYSE, AMEX, and NASDAQ.

The asset based factor model can be expressed as:

$$r_t - r_{ft} = \alpha_t + \beta_1(Equity) + \beta_2(SMB) + \beta_3(HML) + \beta_4(Momentum) + \beta_5(CreditSpread) + \varepsilon_i \quad (14)$$

[11] mba.tuck.dartmouth.edu/pages/faculty/ken.french/data_library.html

The dependent factor is the monthly return of the activist hedge fund index minus the risk-free (r_f) 30-day T-bill rate, in other words the excess return of the asset weighted average of the activist hedge funds. The 30-day T-bill rate is used as a proxy for the risk-free rate as the study uses monthly returns and all the studied hedge funds are based in the U.S.

Independent variables are:

MSCI World (equity)

Multi-collinearity limits the model to include only one broad equity index as an explanatory factor. In order to maximize the validity of the model in of the stock markets, different equity indices are tested and the one that provides the highest residual square to the model is chosen. MSCI World index includes a selection of stocks of all the developed markets in the world and it is maintained by Morgan Stanley. The index includes securities from 23 countries, and has been calculated since December 31, 1969.

Table 13: Explanatory power of different equity indices

This table presents the explanatory power of the different equity indices that were tested as explanatory factors in the asset based model that is used to explain the monthly returns of the asset weighted index on activist hedge funds included in the study. The adjusted residual square measures the explanatory power of the chosen model.

Index	R^2	**Adjusted** R^2
Russell 1000	0.49	0.46
Russell 1000 Growth	0.48	0.45
Russell 1000 Value	0.49	0.46
Russell 2000	0.48	0.44
Russell 2000 Growth	0.40	0.46
Russell 2000 Value	0.46	0.42
Russell 3000	0.49	0.45
Russell 3000 Growth	0.48	0.45
Russell 3000 Value	0.49	0.45
S&P500	0.49	0.45
S&P1500	0.49	0.45
MSCI World High Dividend	0.42	0.47
MSCI AC World TR Index Gross USD	**0.55**	**0.51**

SMB

To be able to include the investments in stocks with a small capitalization, the monthly return on a portfolio of small stocks minus the monthly return on a portfolio of large stocks is used [see Fama and French (1995 and 1996)].

HML

In order to measure the returns of so-called value investing, the monthly returns on a portfolio of high book-to-market stock minus the monthly return on a portfolio of low book-to-market stock is used (see Fama and French (1995 and 1996)).

Momentum

An investment strategy of buying stocks with the highest past performance and selling those with the lowest past performance is called as momentum investing. Momentum is the average return on the two high prior return portfolios minus the average return on the two low prior return portfolios of the stock listed in NYSE, AMEX, and NASDAQ. By adding the momentum factor in the regression, the past performance of the chosen stocks is included in the model.

Credit Spread

Credit spread is the difference between the Merrill Lynch High-yield Master Index, which consists of 1,966 bonds rated BB or lower, and a 10-year constant maturity Treasury note. The credit spread reflects the additional net yield an investor can earn from a security with more credit spread relative to one with less credit risk and is found to have explanatory power in hedge fund returns (for example by Fung and Hsieh, 2001). Credit spreads include information on the expected economic conditions that should affect the returns of activist funds.

Table 14 reports the descriptive statistics of the independent variables.

Table 14: Monthly statistics of the independent factors

This table reports the descriptive statistics of the monthly return from the sample period of January 2002 – December 2006 consisting of 60 monthly returns per factor.

	Activists	Risk-free	MSCI World	SMB	HML	Momentum	Credit Spread
Mean	1.2%	0.2%	1.0%	0.5%	0.7%	0.3%	-0.8%
Median	1.2%	0.1%	1.6%	0.5%	1.0%	0.6%	-0.3%
Maximum	3.6%	0.4%	8.9%	5.8%	4.4%	9.7%	9.1%
Minimum	-2.4%	0.1%	-11.0%	-5.1%	-6.6%	-16.3%	-15.0%
Std. Dev.	1.3%	0.1%	3.7%	2.6%	2.0%	4.3%	2.9%
Skewness	-0.66	0.79	-0.69	0.03	-0.71	-1.01	-1.55
Kurtosis	3.59	2.13	4.11	2.34	4.45	6.11	12.52

6.3 Fund size

In order to classify hedge funds by their size, I first separate them into five different size buckets. As there are large differences between the sizes of the funds, I have used the logarithms of the assets sizes to allocate funds into rightly sized buckets.

In order to test the effect of the fund size on the returns of the hedge funds the following linear regression is applied:

$$r_t = \alpha_t + \beta_1 \log(NAV_i) + \varepsilon_i \tag{15}$$

A quadratic regression can be expressed as:

$$r_t = \alpha_t + \beta_1 \log(NAV_i) + \beta_2 \log(NAV_i)^2 + \varepsilon_i \tag{16}$$

The process of testing the effect of fund size on manager skill (alpha) has two phases. First the asset-based model specified in section 6.2 measures alpha. After that the following linear regression model explains the relationship between the alphas and size:

$$Alpha_t = \alpha_t + \beta_1 \log(NAV_i) + \varepsilon_i \tag{17}$$

A quadratic regression of the same test is specified of the form of:

$$Alpha_t = \alpha_t + \beta_1 \log(NAV_i) + \beta_2 \log(NAV_i)^2 + \varepsilon_i \tag{18}$$

Chapter 7. Empirical findings

This section reports the results of the study. I start with the results from basic performance attribution measures. After that the results of the hedge fund style model and the asset-based model are reported. The findings of these analyses build up a basis for testing the impact of size in the performance of activist hedge funds. Several tests have been done of which the most significant and robust results are included in the text and tables.

7.1 Performance attribution

The most straightforward way for a return attribution comparison between different style indices is the use of general attribution tools such as a mean-variance-framework. Table 15 presents the findings for the general hedge fund indices.

Table 15: Performance ratios 2002-2006

This table presents the annual geometric return, volatility and semi-deviation of the S/P500 and MSCI World Equity indices, six CSFB hedge fund indices whose fund self-claim to invest mostly in shares and the Shareholder Activist index that is constructed in this study. The Sharpe and Omega ratios are measured for the whole sample periods. The Sharpe ratio assumes an annual risk-free ratio of 2.3% p.a. which was the average for 30 day Treasure Bills during the sample period. The threshold of Omega is set to 1% per month, which is often referred to be an industry expectation for a successful hedge fund.

Index	Annual Return	Annual Volatility	Annual Semi-deviation	Sharpe	Omega
SP500	6.2%	12.4%	9.6%	0.31	1.00
MSCI	11.3%	12.7%	9.6%	0.71	1.22
Convertible Arbitrage	5.9%	4.2%	3.3%	0.87	0.67
Emerging Markets	17.1%	7.3%	5.2%	2.01	2.00
Equity Market Neutral	7.6%	1.9%	0.5%	2.84	0.22
Event Driven	11.6%	4.1%	4.3%	2.27	1.00
Multi-Strategy	11.0%	4.3%	4.2%	2.04	0.94
Risk Arbitrage	4.3%	3.2%	2.4%	0.64	0.18
Long/Short Equity	10.1%	5.5%	3.1%	1.41	0.88
Shareholder activists	14.8%	4.4%	3.0%	2.87	1.40

When the monthly returns of activist hedge funds are compared with the returns of the indices based on other hedge funds, it can be seen that they outperform all the other strategies except for the emerging markets strategy. However, the higher returns of the funds following the emerging markets strategy include a higher level of risk as the volatility of the monthly returns in this category is 18% higher than the volatility of the activists'. By distinguishing the volatility into the upside movement and the downside movement, I was able to find out that the downside movement volatility of emerging markets funds is 73% higher than that of the activists.

Due to the high Omega value and semi-deviation that the emerging markets funds have, it can be argued that in general they offer higher returns to the investor but also bear a much higher risk for large dropdowns in a fund's value than activists. Event driven and multi-strategy funds have also been profitable investments during the sample period but their returns have included higher risk levels. This is shown by their higher volatilities companied with lower Sharpe and Omega values.

A t-test for differences in the means of populations with unequal variances is conducted in order to analyze the significance of the difference in the means of the monthly returns. As table 16 reports, the returns of the activist funds have been significantly higher than the returns on convertible arbitrage and equity market neutral strategies. Apart from the emerging markets funds, the mean of the activist returns is clearly higher but not yet statistically significant to derive conclusions from the results.

Table 16: Test for differences in means

This table reports the results of the t-test for the differences between population means when the population's variances are assumed to be unequal. The monthly returns of the activist hedge fund index are compared with the monthly returns of the /P500 and MSCI World Equity indices and six CSFB hedge fund indices whose fund self-claim to invest mostly in shares. T-value reports the perceived difference in the means and the "Probability" the probability to reject a hypothesis on the significance of the difference.

	SP500	MSCI	Convertible Arbitrage	Emerging Markets	Equity Market Neutral	Event Driven	Multi-Strategy	Risk Arbitrage
t-value	-1.226	-0.403	-3.009	0.558	-3.102	-1.057	-1.235	-3.995
Probability	0.112	0.344	0.002	0.289	0.001	0.146	0.110	0.000

As the preferences and risk aversions of investors differ from each other, it is rather challenging to claim one strategy to be better than the other. To rank the hedge funds strategies, the following model has been conducted: the monthly returns of the different indices are ranked by seven dimensions. The indices are then ranked by their order among these dimensions. Finally the results of the individual rankings are summed and the strategy with the best overall performance is claimed to be superior to the others. It can be seen from the results, presented in table 17, that due to their stable positive monthly returns, the activist fund index outperforms other indices when this framework is implemented. Equity markets had a strong decline in the beginning of the sample period. This partly explains the low relative performance of the S/P500 Index.

Table 17: Strategy Ranking

In this table the descriptive statistics of the hedge fund indices are ranked among seven different dimensions. With return based measure, mean, Sharpe, Omega, max and min the index with the highest value receives the lowest score and the with risk based measurement, Volatility and Semi-Deviation, the index with the lowest value receives the lowest score. The scores are summed in the last column and the index with the lowest score is chosen to be the most lucrative.

Index	Mean	Volatility	Semi-deviation	Sharpe	Omega	Max	Min	Score
Activists	2	6	3	1	2	6	2	22
Equity Market Neutral	7	1	1	2	9	10	1	31
Event Driven	3	3	7	3	4	7	6	33
Emerging Markets	1	8	8	5	1	3	8	34
Multi-Strategy	5	5	6	4	6	5	5	36
Long/Short Equity	6	7	4	6	7	4	4	38
MSCI	4	10	9	8	3	1	10	45
Risk Arbitrage	10	2	2	9	10	9	3	45
Convertible Arbitrage	9	4	5	7	8	8	7	48
S/P500	8	9	10	10	5	2	9	53

The findings of this section provide a start for a test on the ranking of the performance of different hedge funds strategies but due to its simplistic and partly subjective construction the result is not robust and conclusions cannot be drawn.

7.1.1 Performance attribution – a more robust view

To improve the study, the characteristics of the monthly return distributions are studied. We test the return distributions for higher moments and normality. It can be clearly seen from table 18 that the bandwidth of the distribution of hedge funds has been more narrow during the sample period than the one of the equity markets. Also the assumption of normality on the monthly return distributions can be rejected with almost all different strategies, as the high Jarque-Bera figures in p-values reject the hypothesis on normally distributed returns. The non-normality of the returns is in line with the literature on hedge funds but can also be caused by a relatively small sample size of 60 individual monthly returns per strategy.

Table 18: Monthly returns 2002-2006: distribution characteristics

This table presents the annual maximum monthly returns of the indices. Skewness describes how asymmetric the distribution is and Kurtosis indicates the existence of extreme returns. The Jarque-Bera figure is used to test the normality of the distribution. The probability is based on the Jarque-Bera figure and it indicates the probability that the return distribution is normal.

Index	Max	Min	Skewness	Kurtosis	Jarque-Bera	Probability
SP500	8.8%	-10.9%	-0.6	4.3	7.9	1.9%
MSCI	8.9%	-11.0%	-0.7	4.1	7.9	2.0%
Convertible Arbitrage	3.0%	-3.2%	-0.9	4.2	11.4	0.3%
Emerging Markets	5.8%	-5.0%	-0.8	3.7	7.8	2.1%
Equity Market Neutral	2.1%	-0.3%	0.7	3.4	5.4	6.7%
Event Driven	3.3%	-3.1%	-1.1	5.5	28.2	0.0%
Multi-Strategy	3.9%	-3.1%	-0.8	5.2	18.0	0.0%
Risk Arbitrage	3.0%	-2.7%	-0.3	4.9	10.6	0.5%
Long/Short Equity	4.2%	-3.0%	-0.3	2.6	1.3	52.7%
Shareholder activists	3.6%	-2.4%	-0.7	3.6	5.2	7.3%

As the return distributions are proven to be non-normal, a non-parametric test is implemented. I use the Wilcoxon Rank Sum test[12] for the hypothesis that the median monthly return of activist hedge funds is higher than the other indices. The results of the test, presented in table 19, indicate that the test supports this with 95% certainty for the convertible arbitrage, equity market neutral and risk arbitrage indices. Strong but not significant support is also provided that activists have a higher median than the other studies indices, except for global equities proxied by MSCI World and hedge funds following the emerging markets strategy. The test also provides support for a hypothesis that the median returns of the emerging markets strategies are significantly more distributed to the right than the returns of the activist funds.

Table 19. Non-parametric test for medians

This table reports the results of the Wilcoxon Rank Sum test where the hypothesis median of the activist hedge funds is higher than the median of the studied index is tested. The final column "P-value" reports the probability that the hypothesis can be rejected.

Index	Z-value	P-value
SP500	0.9133	0.1806
MSCI	-0.3622	0.6414
Convertible Arbitrage	3.1229	0.0009
Emerging Markets	-1.3909	0.9719
Equity Market Neutral	3.758	0.0001
Event Driven	1.2177	0.1117
Multi-Strategy	1.5798	0.0571
Risk Arbitrage	4.3081	0.0000
Long/Short Equity	1.2229	0.1107

The smoothing that indices include might have contaminated the results and might have made them less robust. Several other studies have also used CSFB indices, which can lead to a data mining bias if the findings of this study are compared with the general findings provided by other articles. In order to minimize the data mining bias and to make the study more transparent and robust, I have gathered the monthly return data of all the hedge fund strategies that are included in the TASS database and constructed another index that uses mean returns of activists funds.

A cynic might claim that as the CSFB indices also use the TASS as their source, the added value of the new approach is limited. However, as the results on performance figures of the strategy means do not correlate significantly with the CSFB indices and the construction method is logical, it is hard to suspect the mean indices not to provide additional information on the performance of the strategies.

[12] Wilcoxon Rank Sum Test uses nonparametric statistics to compare the locations of two populations, to determine if one population is shifted with respect to another. The method employed is a sum of ranks comparison.

The reason to use aggregate measures as strategies rather than to compare individual funds is that institutional investors tend to diversify their investments in hedge funds and there is always a possibility for an exceptional behaviour caused by a difference in the hedge fund's self-claimed strategy and the reality.

We use the following two selection methods for activist funds in the new sample.

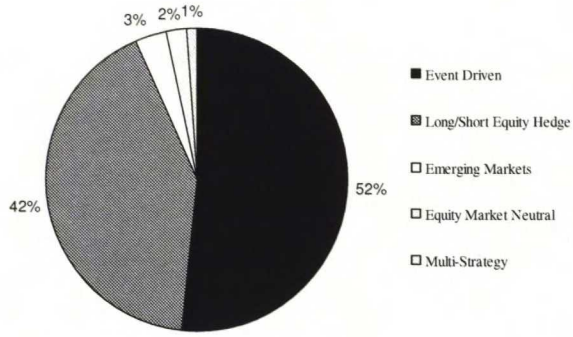
(i) In order to exclude the performance differences due to fluctuations in currencies, only funds reporting in USD are included.

(ii) Only funds with average assets under management of over $20,000,000 during the sample period are included. The motive for excluding the smallest funds is to make the test more robust. A hedge fund manager that has $20 million to invest in might start four funds with an extreme level of risk and only report to TASS the one with the best returns. CSFB indices have a limit of $10 million to include an individual hedge funds in the index thus the data source of the additional population is different.

Table 20a reports the descriptive statistics for the additional population and table 20b illustrates the number of funds included in it. An important remark is that many of the activist hedge funds are double counted in the study, as hedge funds from TASS are also included in their own strategy group.

Figure 6 reports the main strategies that the activist hedge funds claim to follow. As the study is done on mean returns, I do not see this double counting problematic as the magnitude of the problem is relatively low. The event driven strategy consists of several sub-classes and activist should be seen as one of those.

Figure 6: Self-claimed main strategies of the activist funds



Strategy	Number
Event Driven	46
Long/Short Equity Hedge	37
Emerging Markets	3
Equity Market Neutral	2
Multi-Strategy	1
	89

By including the TASS universe into the study, we get some extremely interesting findings related to the underlying hypothesis of the thesis that the returns from the traditional arbitrages are eroding. In the literature, one of the most used examples for the eroding arbitrages is the Convertible Arbitrage strategy. According to the annual returns of the CSFB Convertible Arbitrage Index, the strategy indeed suffered from declining returns in 2004 and 2005, when the majority of studies were published that reported this return erosion. However, returns recovered in 2006 to an impressive 13.8% annual return for the mean.

Table 20a: Descriptive statistics (per funds with AUM over $20,000,000)

This table presents the annual return (r) and volatility (σ) for all the hedge fund strategies that are included in the TASS database. The sample includes all the funds whose average assets under management amount was over $20,000,000 during the sample period and whose returns are reported in USD. Both arithmetic average and the asset-weighted average measured on a monthly level are reported. The activists group includes all 93 activist hedge funds identified for this study, the asset weighted figures of this group includes 92 hedge funds as one of the sample funds does not report its assets under management. The group "Activists with AUM >20 $mil includes 60 activists hedge funds whose average assets under management were over $20,000,000 on the sample period.

		2002 %		2003 %		2004 %		2005 %		2006 %		2002-2006 (Annualised %)	
		R	Σ	r	σ	r	σ	r	Σ	r	σ	r	σ
Convertible Arbitrage	Mean	8.9	5.7	14.4	3.5	3.2	2.7	-1.3	4.9	13.8	1.9	7.6	4.2
Dedicated Short Bias	Mean	25.1	11.7	-25.5	10.3	-11.5	11.9	4.1	10.8	-18.3	11.5	-6.8	12.1
Emerging Markets	Mean	13.2	9.6	40.1	6.9	18.7	7.9	22.8	9.1	23.7	9.0	23.4	8.5
Equity Market Neutral	Mean	6.3	1.1	6.1	1.1	5.5	1.6	5.9	1.2	9.0	1.3	6.5	1.3
Event Driven	Mean	2.9	4.6	21.6	2.6	13.8	3.7	8.0	3.2	14.8	3.0	12.0	3.8
Fixed Income Arbitrage	Mean	9.2	2.2	8.9	2.3	7.4	0.8	6.3	1.0	8.2	0.8	8.0	1.5
Fund of Funds	Mean	2.6	2.2	11.9	2.2	7.2	3.7	7.9	4.3	10.5	4.8	8.0	3.6
Global Macro	Mean	8.7	2.8	20.0	5.6	3.9	4.1	8.5	3.7	5.8	3.9	9.3	4.2
L/S Equity Hedge	Mean	-0.4	5.5	23.7	4.8	9.6	5.2	11.6	6.1	12.1	6.0	11.0	5.7
Managed Futures	Mean	13.6	9.6	9.6	8.8	3.5	9.3	3.7	7.4	6.3	6.9	7.3	8.3
Multi- Strategy	Mean	7.0	2.6	22.0	2.6	10.8	3.0	11.2	4.2	12.9	3.2	12.7	3.3
Activists	Mean	5.7	7.8	29.4	4.7	19.3	5.9	10.9	5.3	15.4	5.7	15.9	6.1
Activists with >$20 mil	Mean	6.3	7.2	27.6	4.1	19.0	4.8	12.1	4.6	16.1	5.5	16.0	5.5

Table 20b: Funds of Table 20a

This table presents the number of individual hedge funds that are included in table 11a. The first column reports the number of funds in the database per strategy, column "Assets in sample period" the number of funds that reported to have assets under management (AUM) during the sample period. Column "In USD" the number of above mentioned funds having USD as their base currency and finally the column ">20,000,000" the amount of funds that meet all the other criteria and whose average amount of assets under management was above $20,000,000 during the sample period. The last column indicates the number of funds whose return data was included in the strategy categories of the table 20a.

	Total	Asset in Sample period	In USD	>20,000,000
Convertible Arbitrage	212	162	151	118
Dedicated Short Bias	38	27	26	12
Emerging Markets	412	249	228	164
Equity Market Neutral	434	336	276	152
Event Driven	591	472	441	331
Fixed Income Arbitrage	335	241	195	144
Fund of Funds	1,916	1,395	991	674
Global Macro	374	231	191	116
Long/Short Equity Hedge	2,302	1,696	1,439	845
Managed Futures	684	413	325	120
Multi-Strategy	285	225	197	124
Total	7,583	5,447	4,460	2,800

During the sample period, the average monthly returns were the highest for emerging market funds with an annualised return of 23.4%. Both the sample groups for activist hedge funds have an annualised return of 16%, which is clearly above the returns of the other hedge fund strategy groups. Except from managed futures, dedicated short bias and emerging markets, the volatility of activist hedge funds was higher than the volatilities of other strategies.

The use of monthly return means instead of asset weighted ones changes the ranking of the strategies. The major difference between this ranking and the first one, presented in table 21, is the use of means instead of asset-weighted averages. As the largest funds have a lower impact on the performance proxy, a better view is gained on the overall characteristics of the strategy. Table 21 reports the ranking of the strategies based on a second test on the mean returns of the TASS strategies. The relatively high-risk ratios, represented by semi-deviation and highest dropdown measured by the lowest monthly return, bring the rankings of the activist funds to an average level from the top position that they gained when they were compared with the SCFB indices.

The population of strategy group means provides a relatively equal ranking but serves as a tool to compare the risk-returns characteristics of individual strategies. It can be seen that relative to other strategy groups, activist funds outperform on performance but bear higher risks than many of the traditional strategies.

Table 21: Strategy Ranking

This table reports the descriptive statistics of the mean monthly returns of different investment strategies in the TASS hedge fund database. The monthly returns are ranked among seven different dimensions. With the return based measures, mean, Sharpe, Omega max and min the index with the highest value receives the lowest score and with the risk based measures, Volatility and Semi-Deviation, the index with the lowest value receives the lowest score. The scores are summed in the last column and the index with the lowest score is chosen to be the most lucrative.

Index	Mean	Volatility	Semi-deviation	Sharpe	Omega	Max	Min	Score
Multi-Strategy	4	3	3	2	4	11	3	30
Fixed Income Arbitrage	9	2	1	1	12	13	2	40
Emerging Markets	1	12	9	4	1	3	10	40
Activists with AUM >20 $mil	**2**	**8**	**10**	**5**	**2**	**5**	**9**	**41**
Equity Market Neutral	12	1	2	3	10	12	1	41
Global Macro	7	6	4	8	8	7	4	44
Event Driven	5	5	6	6	7	10	5	44
Activists	**3**	**10**	**11**	**7**	**3**	**2**	**11**	**47**
Long/Short Equity Hedge	6	9	8	9	5	6	7	50
Fund of Funds	8	4	5	10	9	9	6	51
Convertible Arbitrage	10	7	7	11	11	8	8	62

An important remark about the whole activist sample and the sample that excludes the smallest activists, is that larger activist funds outperform the smaller ones. The maximum monthly return is the only dimension in which smaller funds seem to outperform the larger ones is. As the holding periods of the activist funds are relatively short (less than two years according to a working paper by Boyson and Mooradian, 2007) the main source for the activist returns are the market reactions to the activist's involvement in the target company and the success of the activist campaign.

The smaller the fund and the less diversification it has, the more effect the individual events have on the fund's performance. It can be argued that the higher maximum returns of the sample including the smaller activist funds support this view. The next section provides information on the correlation that the hedge funds strategies have with the equity indices.

7.1.2 Correlations

As it has been stated in earlier sections of this thesis, hedge funds claim to offer significant diversification benefits to investors as they have low correlation with the traditional asset classes. In theory, investors should be reluctant to invest in hedge funds with high exposure to the markets because (a) they are able to gain the same exposure from passive investment vehicles at a fraction of the costs, (b) in case the returns of the hedge fund generates positive returns because the market goes up, it will likely decrease its value when the market goes down.

We test the correlation that the hedge fund indices have with U.S. equity proxied by the S/P500 Index and global equity proxied by the MSCI World Index. The methodology used is a simple linear regression that includes two lagged market returns in order to capture the stale or managed prices that increase the market exposure on the strategies with illiquid exchange-traded securities or difficult-to-price over-the-counter securities. This method has been used in several studies such as Asness et al (2001), Liang (2001), and, Agarwal and Naik (1999) that all report exposures with lagged market returns. An interesting "side-product" that serves the purpose of this thesis, is the alpha that equals to the portion of the return that cannot be explained by the market movement and thus is expected to be the result of the manager's skill such as superior stock picking or gained risk premiums.

Table 22 reports the findings of the model. It can be seen from the values of the coefficient of determination (R^2) that the equity markets do not have nearly any explanatory power on the monthly returns of the hedge funds that claim to follow a market neutral strategy. Intuitively this result is exactly what to expect as the strategy stands for zero correlation with the markets. It can be seen that activist hedge funds have exposure in equity markets with a total beta exposure (including two lagged months) remaining on average around 40% to 44%. This beta is similar to the beta of the event driven strategy whose underlying investment style is closest to the one that activists follow.

Table 22: Linear regression with hedge fund strategies

This table reports the correlations of different indices with the U.S. equity markets that are proxied by S/P500 Index and the world equities that are proxied by MSCI World Equity Index. The alpha figure represents the monthly return (%) that is not explained by the index.

	Alpha				Beta				Model
Independent variable	**Coef.**	**Std. Error**	**t**	**Prob.**	**Coef.**	**Std. Error**	**T**	**Prob.**	**R^2**
Convertible Arbitrage	0.94	0.17	5.57	0.00	0.63	1.31	4.8	0.00	0.28
Emerging Markets	0.91	0.18	5.07	0.00	0.81	0.18	4.32	0.00	0.24
Equity Market Neutral	1.07	0.15	6.99	0.00	-0.35	0.06	-5.58	0.00	0.33
Event Driven	0.47	0.15	3.12	0.00	0.57	0.06	8.65	0.00	0.56
Multi-Strategy	0.36	0.29	1.24	0.21	2.52	0.68	3.67	0.00	0.17
Risk Arbitrage	0.62	0.34	1.84	0.07	1.45	0.66	2.18	0.03	0.08
L/S Equity hedge	0.57	0.13	4.34	0.00	1.36	0.13	9.89	0.00	0.62

7.2 Hedge fund style model

The first test of the relation between performance of activists and traditional funds is rather simplistic as it does not pursue to explain the factors affecting the performance of hedge funds. In this section, the approach is more quantitative as the monthly returns of activist hedge funds are explained by the monthly returns of the CSFB indices. This section includes test where either CSFB hedge fund indices or mean returns of the TASS hedge funds have been used as an independent variable. The first part regresses the returns of the shareholder activist index against different CSFB indices individually to test the explanatory power of the hedge funds' styles in activist returns. Then, the most comprehensive model possible is constructed from the CSFB indices, taking multicollinearity into account, to analyze the possible alpha of activist funds in comparison to other hedge funds. Thirdly, the alphas spotted in the second part are tested with the mean returns per style in the TASS database to increase the robustness of the models.

7.2.1 Explanatory power of individual indices

The underlying idea behind this analysis is that the invisible factors affecting activist hedge fund returns are also included in the returns of the other hedge funds. A good example for this are the returns of the event driven hedge funds. Both activists and even driven hedge funds rely on the success of a particular event and one can assume that several event driven hedge funds invest in the companies targeted by activists. We start the regressions by analysing the explanatory power of individual styles.

Table 23 reports the results of the individual linear regressions. The beta coefficients describe the relation between the volatility of the activist funds and the style index. All the beta coefficients are statistically significant but as the relatively low coefficient of determination indicates, only the volatility of event driven hedge funds and long / short equity hedge funds correlates for more than 50% with activist hedge funds.

7.2.2 Style model for alpha

None of the regressions in the previous section had an adequate explanatory power for making any robust conclusions on the added value, described by the alpha coefficient, that activist managers might provide in relation to hedge funds in general. For measuring alpha, a model that incorporates several different styles is required.

As table 11 on page 43 reports, many of the CSFB indices are strongly correlated with each other. Using correlated factors in a regression model leads to the problem of multi-collinearity and an assumption of the independent factors is violated. For this reason, only a part of the hedge fund indices are included in the model. We use stepwise regressions where the choice of predictive variables is carried out by an automatic procedure using a sequence of F-tests where the probability limit for removing the factor form regressions is 0.1. In practise this means that first the dependent variable is regressed by the individual factor that has the most explanatory power and after that the rest of the factors are included one by one only in case they improve the model. Table 23 reports the regressions taken in the final model.

Table 23: Style model for activist alphas

This table reports the stepwise regressions that use CSFB indices to explain the alpha in the asset weighted monthly returns in this thesis. Coefficient event driven refers to the monthly returns of the CSFB Event Driven hedge fund index. Risk arbitrage to the monthly returns of the CSFB Risk Arbitrage hedge funds index and Convertible Arbitrage to the monthly returns of the CSFB Convertible Arbitrage hedge fund index. All the returns are net of fees and the CSFB strategies use asset weighted average returns. Assuming the benchmark factors are appropriately and exhaustively chosen, the average residual component (intercept) thus expresses returns added by the manager alone (also known as manager alpha).

Dependent variable: Activist Index (monthly returns)

Regression #	Independent variable	Coef.	Std. Error	t	Sig.	R	R^2	Adj. R^2	Std. Error
1	Alpha	0.226	0.085	2.669	0.010	0.926	0.858	0.855	0.516
	Event Driven	1.056	0.056	18.694	0.000				
2	Alpha	0.272	0.083	3.283	0.002	0.934	0.873	0.868	0.492
	Event Driven	0.905	0.079	11.412	0.000				
	Risk Arbitrage	0.263	0.102	2.587	0.012				
3	Alpha	0.268	0.080	3.335	0.002	0.939	0.882	0.876	0.478
	Event Driven	0.979	0.084	11.587	0.000				
	Risk Arbitrage	0.260	0.099	2.634	0.011				
	Convertible Arbitrage	-0.130	0.061	-2.120	0.038				

It can be seen from the regression results above that the final model is able to explain approximately 94% of the variance in the monthly returns of activist hedge funds. The most dominating index is CSFB Event Driven whose beta is approximately one that enables a direct comparison between the indices. The average residual component that is expressed as alpha in the model expresses returns added by the manager alone (also known as manager alpha). The alpha coefficient is statistically significant in all three regressions and supports evidence that the annualised excess return of activist hedge funds against event driven funds is between 2.8% to 3.3%.

To test the validity of the model, we perform several tests to find out whether the model violates the assumptions on the distribution of residual inbuilt in the linear regression model. The Durbin Watson coefficient of 2.3 reports a residual of the model to bear slight negative autocorrelation. The regression was tested with the autocorrelation coefficient AR(-1) but that did not significantly change the regression results. The Jarque-Bera test did not reject the assumption of normality of the residuals. Possible heteroscedasticiy was also tested with a Lagrange Multiplier test and the hypothesis of heteroscedastiticy did not gain a p-value high enough (0.21) to be statistically significant. A VIF-test for multicollinearity provided the highest value of 2.6, which indicates low collinearity between the indices.

7.2.3 A style model for alpha with activists' means

In order to improve the robustness of the findings made in the previous section, I perform similar stepwise regressions where the means of the TASS strategies are used as independent variables. The sample group is the same as in section 6.1.3, where the construction is discussed in more detail. The dependent variable in the regression model is the mean returns of the activist hedge funds whose average assets were higher than $20,000,000 in the sample period. I prefer to use means instead of asset-weighted averages (activist index) to match the activist hedge funds better with the sample. I exclude the smallest funds as the peer sample has also been cleared from the smallest funds. Like the previous section, stepwise regression analysis is implemented. Table 24 reports the findings.

Table 24: Style model for activist alphas (mean values)

This table reports the stepwise regressions that mean values of the TASS strategy groups to explain the alpha in the asset weighted monthly returns in this thesis. The coefficient of event driven funds refers to the mean of monthly returns of event driven fund in the TASS database and emerging markets to the mean of the monthly returns of the CSFB risk arbitrage hedge funds index and convertible arbitrage to the monthly returns of the CSFB convertible arbitrage hedge fund index. All the returns are net of fees and the CSFB strategies use asset weighted average returns. Assuming the benchmark factors are appropriately and exhaustively chosen, the average residual component (intercept) thus expresses returns added by the manager alone (also known as manager alpha).

Dependent variable: Mean monthly returns of activist hedge funds with average AUM >$20,000,000

Model #	Independent variable	Coef.	Std. Error	T	Sig.	R	R^2	Adj. R^2	Std. Error
1	Alpha	-0.008	0.089	-0.091	0.928	0.949	0.901	0.899	0.479
	Event Driven	1.909	0.086	22.195	0.000				
2	Alpha	-0.030	0.081	-0.371	0.712	0.959	0.920	0.917	0.435
	Event Driven	1.625	0.112	14.494	0.000				
	Emerging Markets	0.165	0.047	3.527	0.001				

As with hedge fund indices, the event driven strategy is the main contributor in the explanatory power of the model. The second model of stepwise regressions is able to explain 96% of the variance of activist funds. An interesting finding is that when the mean values are used, the beta of the risk factors that event driven funds is significantly higher than in the regressions based on asset-weighted averages. The regressions on means of the hedge fund strategies do not provide any evidence on manager skill of the activist managers. Similar sanity checks as in section 7.2.2 were done for the model and no evidence for autocorrelation, heteroscedasticity or non-normality of the residuals was found.

7.3 Asset based model

After testing the added value of activist funds in relation to other hedge funds, it is time to have a look if activist managers are providing alpha when their returns are explained with observable market factors. In this section, I present the empirical findings of the asset based factor model, introduced in section 6.2. The beginning of the section studies the possibility of violations of underlying assumptions behind the linear regression mode. After that, the explanatory power of the model and the individual factors are reported and discussed. Finally, the test is performed with different markets for a robustness check.

7.3.1 Factor multi-collinearity

Sharpe (1992) points out that the factors used in a model should be mutually exclusive for the model work appropriately. The purpose of the first test is to find out whether the dependent variables are not correlated together i.e. the model is free from multicollinearity.

Table 25: Estimated correlations between independent factors

This table reports the Pearson correlations between the independent factors of the asset-based model used in the thesis.

	MSCI World	SMB	HML	Risk-free rate	Momentum	Credit Spread
MSCI World	1					
SMB	0.264	1.000				
HML	-0.163	-0.006	1.000			
Risk-free date	-0.056	-0.153	0.032	1.000		
Momentum	-0.518	0.089	0.396	-0.027	1.000	
Credit Spread	-0.147	0.076	-0.058	-0.081	0.143	1.000

As table 25 reports, there seems to be some correlation between the independent variables and thus the model is required to be tested for multicollinearity to ensure its robustness. For a more formal approach, we run a multi-collinearity assessment using the Variance Inflation Factor (VIF) test where the dependent variable is the asset weighted monthly returns of activist hedge funds (also called as activist index in this thesis) and the independent variables are the ones of the asset based model. The resulting VIF-statistics are presented in Table 26.

Table 26: Factor Multi-Collinearity Assessment

Dependent variable: Activists Index (Asset weighted average monthly returns– risk-free rate)
Adjusted R^2 = 0.51

Predictor	Std. Coefficient	VIF value
MSCI World	0.555	0.343
SMB	0.820	0.201
HML	0.766	0.021
Momentum	0.513	0.170
Credit Spread	0.591	0.328

As a rule of thumb, a VIF-coefficient larger than 10 indicates a substantial increase in factor coefficient variance due to collinearity between the included repressors. The VIF values of the regression are far below the limit for assuming the model to suffer from multi-collinearity.

7.3.2 Explanatory power for individual factors

After making sure that the factors are not correlated, the next question is how much the individual factors correspond of explanatory power of the model. As stated earlier, the chosen factors together explain 55% of the variance of the monthly returns of activist hedge funds. The regression models used in mutual funds research have generally higher explanatory power than the model we use in this study. Hedge funds are not required to follow a named benchmark, which can be seen in the explanatory powers of the regression model in hedge fund literature described in table 5. The model is not relatively impressive but as the residual square factor of the model is higher than in the hedge fund literature in general.

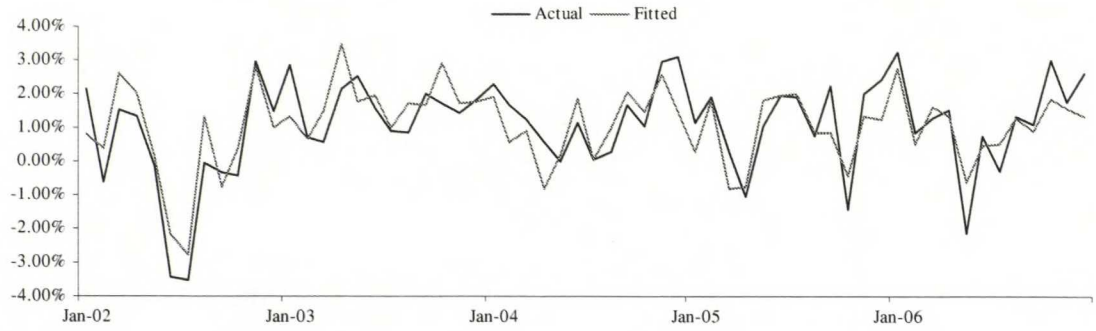
Table 27: Explanatory power of factors
This table presents the impact on the adjusted residual square and standard errors when one factor is excluded from regression.

Asset based model	Adjusted-R^2	Standard Error
All factors included	55.0%	1.00%
MSCI World excluded	31.1%	1.18%
SMB excluded	40.9%	1.09%
HML excluded	49.0%	1.02%
Momentum excluded	51.7%	0.99%
Credit Spread excluded	50.0%	1.01%

As it can be seen from table 27, the exclusion of the equity factors has the highest impact on the explanatory power of the model. Another important contributor is investing small cap (SMB) whose exclusion from the model decreases its explanatory power by nearly 14%. It is logical that the equity index has a high contribution in the model but surprising is the impact of the credit spread. The exclusion of investing in small stock with small capitalisation drops has also a high impact on the model as it decreases the explanatory power by nearly 15%. The contributions of the other factors are relatively smaller.

Figure 4, on the next page, illustrates the relation between the results of the model and the performance of the index that proxies activist funds.

Figure 4: Explanatory power of asset-based model



7.3.3 Factor loadings

The asset-based model is able to explain approximately half of the variance of the activist hedge fund index. The goodness of fit of the model is over 99.99% when the F-statistic is used to measure the probability that at least one of the independent factors has a significant explanatory power on the dependent factors variance. In order to improve the explanatory power and robustness of the study, regressions are run for four different dependent variables. Table 28 on the next page reports the findings. The first one is the general activist index that is constructed for this study. The index is the asset weighted average of all 92 activist hedge funds that are identified by using the methodology discussed in section 5.3.

As part of the funds claim to follow an activist strategy and the accuracy of this claim is not verified, the activist index is adjusted to include only hedge funds with proven activist campaigns and used as a dependent variable. In table 28, panel A reports the regression for the activist index and panel B for the activist index including only verified activist funds. In panel C the dependent variable is the mean of the monthly returns of all the activists and finally panel D reports the returns of a regression where the dependent variable is the mean of the monthly returns of activists with assets under management of over $20,000,000.

Table 28: Factor Loadings and Alpha

This table reports the regression results of the asset-based model for four different dependent variables: the activist index refers to the asset weighted index on activist returns. "Non-claiming + additional activists" includes an asset weighted average of the activist funds that were identified to be activist due to a proven activist event. The mean of all the activists is the mean of the monthly returns of all 92 activist hedge funds and finally the dependent variable in panel D is the same as the funds in panel C but only including activists with average assets of over $20,000,000. All dependent variables are the return over risk-free rate that is 30 days U.S. T-bill rate. Independent variables include MSCI Worlds index, Fama & French's (1993) SMB and HML, Momentum is an investment strategy of buying stock with the highest past performance and selling those with the lowest past performance. Credit spread is the difference between Merrill Lynch High-yield Master Index and a 10-year constant maturity Treasury note. The F-statistic measures the probability that at least one of the independent variables explains the variance of the dependent factor and is implemented to measure the goodness of fit of the regressions.

Panel A				
Dependent factor	**Activist Index**		**F-statistic:**	13.227
			Probability	(0.00)
Independent factor	**Coef.**	**Std. Error**	**T**	**Sig.**
Alpha	0.435	0.148	2.943	0.005
MSCI	0.216	0.045	4.805	0.000
SMB	0.189	0.054	3.478	0.001
HML	0.123	0.071	1.736	0.088
Momentum	0.008	0.040	0.215	0.831
Credit spread	-0.062	0.045	-1.383	0.172
R Square	0.551			
Adj. R Square	0.509			
Std. Error	1.000			
Panel B				
Dependent factor	**Non-claiming + additional activists**		**F-statistic:**	27.528
			Probability	(0.00)
Independent factor	**Coef.**	**Std. Error**	**T**	**Sig.**
Alpha	0.325	0.112	2.895	0.006
MSCI	0.221	0.034	6.466	0.000
SMB	0.221	0.041	5.333	0.000
HML	0.183	0.054	3.384	0.001
Momentum	-0.007	0.030	-0.218	0.828
Credit spread	-0.060	0.034	-1.741	0.087
R Square	0.718			
Adj. R Square	0.692			
Std. Error	0.760			
Panel C				
Dependent factor	**Mean of all activists**		**F-statistic:**	35.298
			Probability	(0.00)
Independent factor	**Coef.**	**Std. Error**	**T**	**Sig.**
Alpha	0.266	0.135	1.975	0.053
MSCI	0.321	0.041	7.822	0.000
SMB	0.294	0.050	5.932	0.000
HML	0.148	0.065	2.282	0.026
Momentum	-0.002	0.036	-0.058	0.954
Credit spread	-0.050	0.041	-1.228	0.225
R Square	0.766			
Adj. R Square	0.744			
Std. Error	0.913			
Panel D				
Dependent factor	**Means of activists with AUM >$20,000,000**		**F-statistic:**	25.484
			Probability	(0.00)
Independent factor	**Coef.**	**Std. Error**	**T**	**Sig.**
Alpha	0.330	0.136	2.430	0.018
MSCI	0.263	0.041	6.355	0.000
SMB	0.261	0.050	5.226	0.000
HML	0.183	0.065	2.804	0.007
Momentum	-0.010	0.036	-0.271	0.788
Credit spread	-0.042	0.041	-1.008	0.318
R Square	0.702			
Adj. R Square	0.675			
Std. Error	0.918			

As table 28 reports, the additional models improve the explanatory power on the variance of activist funds' monthly returns. The adjusted coefficients of determination vary from 0.51 of the asset weighted activist index to 0.77 of the regression where the dependent variable is the means of the monthly returns. Results are in line with the comprehensive study of Lehman Brothers of factor loadings of different hedge fund strategies, which report that an increase in credit spread between a firm with a speculative rating and a sovereign borrowed (whose default risk is perceived to be similar to the U.S. Treasury's) has a negative impact on the returns of activist funds. However, none of the models provide sufficient statistical support for this relationship between fund performance and credit spread.

The equity markets proxy (MSCI World) is the main variable in explaining the returns of activist funds. The factor loading of the variable varies between 0.22 and 0.32 and is always statistically significant on a 99.9% level. The finding is in line with zero lag correlations between the returns of the activist funds and general equity indices which can be found in section 6.1.3 of this study.

It is statistically significant on the 99% level, that the spread in the returns of the small stocks with small capitalisation and large capitalisation explains the returns of the activist hedge funds. The finding is exactly what could have been expected as activist hedge funds of a small size in general are limited in their investment scope to small cap stocks. These small cap stocks are covered less by analysts (or not at all) and therefore these stocks are possibly more easily undervalued. The factor loading on the SMB variable varies between 0.19 and 0.26. The factor load is lower in regressions where the performance of the smallest activist funds has a higher influence on the dependent variable.

The HML variable proxies the difference between value stocks and growth stocks and provides controversial findings among the different groups. For the activist index the HML variable does not sufficiently support the hypothesis on investing in value companies on a 95% significance level. However, all the other regressions support the hypothesis of value investing of activist funds. Furthermore, the mean of large activist returns and asset-weighted factor loadings vary between 0.15 and 0.18 and are all statistically significant on 95% level.

None of the regressions support evidence that the momentum variables explain the monthly returns of the activist hedge funds included in the sample. This finding is in line with the section 7.3.2 where the explanatory power of different independent variables was studied. The main purpose on constructing the asset based factor model is to capture the systematic exposures that the hedge fund returns bear and measure the amount of alpha the activist managers are able to provide to their investors. It is important to notice that all the return figures of the hedge funds are net of fees thus they represent the gross added value that the investors receive for their investments in activist hedge funds. All the four regressions support evidence that the monthly alphas are statistically significant from zero on a 99% level. When annualised, the reported alphas vary between 3.2% and 5.3%. The alpha figure for the asset-based index is highest where as the lowest alpha is reported to the regression where the dependent variable was the mean returns of all the activists. The regressions provide clear evidence that more impact do the monthly returns of the smallest activist funds have in the dependent variable lower is the alpha, in other words the larger the activist fund is, the more alphas it seems to generate to its investors.

To briefly conclude this section, the market factor regressions support the hypothesis that activist hedge funds provide alpha to their investors.

7.3.4 Robustness check

For testing the reliability of the asset based model, the same regressions were run using different independent variables to proxy for market risk factors. MSCI Word index was replaced by the SP500 index that converts the exposure of the equity proxy to the U.S. shares. The SMB factor was replaced by the spread between monthly returns of the Wilshire Small Cap 1750 - Wilshire Large Cap 750 indices to include a broader base of stocks in the study. HML was replaced by the spread between the Russell 2000 Value and the Russell 2000 Growth indices and Credit Spread was measured by the monthly change in the Moody's Baa yield less the 10-year treasury constant maturity yield (month end-to-month end).

In general, the use of different factors did not change the levels of significance of the independent factors when compared with the original regressions. The alpha factors are slightly higher on average but this could be explained by the lower explanatory power of the model (average adjusted coefficient of determination is 0.59 whereas with used factors it is 0.65).

7.4 The impact of size

The average amount of net assets under management (NAV) of the activist hedge funds vary between $2,053,888 and $7,538,461,538. It can be assumed that the earnings model and risks that an activist fund bears depend drastically on the amount of money the fund has to invest. A small activist has a limited number of small companies to invests in, limited possibilities for diversification and more need for leveraging in order to purchase sufficiently large stakes in their target companies. Large activist have a wider range of investment opportunities but also a risk of "losing alpha" as the assets are often diversified among a larger amount of companies[13]. Table 29 reports the arithmetic average of five different size buckets that are constructed on five fixed logarithmic intervals. Please note that one of the 92 activist hedge funds in the sample does not report assets under management and it has been excluded from the analysis.

Table 29: Impact of size

This table reports the arithmetic averages of the annualised monthly returns, the annualised volatility of the monthly returns and the annualised monthly alpha measured by the asset based factor model that is introduced in section 5.2. The activist hedge funds are divided into five size buckets. The limits of the size buckets are fixed intervals of the logarithmic assets under management that the funds hold.

Bucket	Size	LN(Assets)	Number of funds	Annual return	Annual Volatility	Annual Alpha
1	< $10,605,176	16.18	13	14.32%	16.91%	4.79%
2	< $54,759,452	17.82	29	13.28%	11.03%	0.99%
3	< $282,748,495	19.46	26	13.46%	11.42%	-1.54%
4	< $1,459,961,867	21.10	14	15.46%	9.56%	3.60%
5	<$7,538,461,538	22.74	9	19.31%	6.82%	7.25%

Table 29 shows that approximately half of the activist funds in the sample are rather small (with assets under management of less than $54,000,000) for a hedge funds. A clear consequence of the large amount of smaller sized activist funds is that a great part of them is forced to invest only in small capitalization stocks. As mentioned before, their target segment often has low or no analyst coverage, which could lead to low market-to-book ratios.

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[13] Euromoney (February 2007) interviewed six European shareholder activists who all stated to have diversification in their portfolios. The number of shares in portfolio varied between five to 30.

According to table 29, their finding does not apply very well to activist hedge funds, apart from the finding of lower median returns of the smallest funds. An interesting finding is the negative correlation between fund size and risk measured by volatility. The finding might either be a result of an increasing level of diversification inside the larger portfolios, or of illiquidity problems of the small cap stock in which the smallest activists invest, or the managers of larger funds might be inclined to take on less risk as they value more there reputation and continuity of the fund (see Boyson). The largest funds might face problems as there is a limited amount of targets to invest in and a risk of trying to big "bites" by attacking large capitalization stocks with a large portion of the fund's assets that thought is sufficient for only a small fraction of the target.

It is important to notice that alpha is always linked with the model being used to derive it. The smallest funds invest in small cap stocks that are not included in the indices and whose value depends more on company specific factors than factors observable in the market indices. The assumption that the coefficient of the term of the model represents manager skill (alpha) in case where the model's other factors doesn't have an explanatory power is not incorrect.

The next three pages report the empirical findings on the impact of size to activist funds' returns, volatility and alpha, respectively.

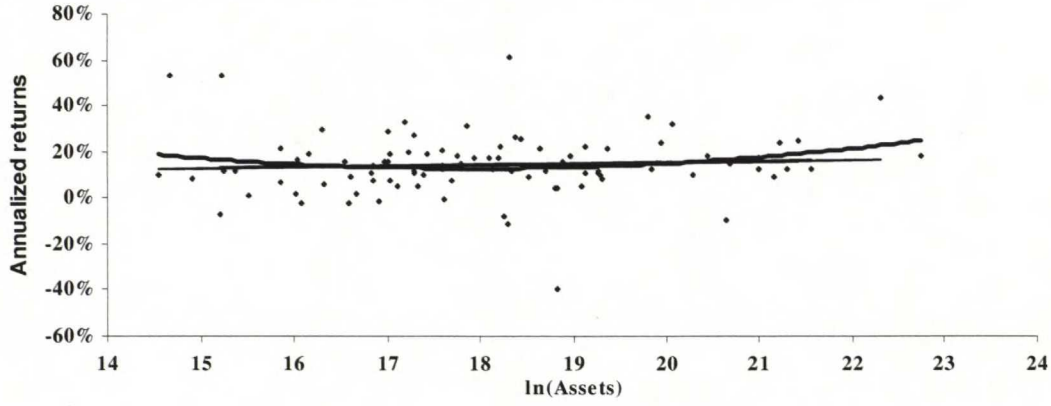
7.4.1 Impact of size – cross-sectional regressions

This sub-section uses cross-sectional regressions to identify the impact of fund size on annualized returns, standard deviations and alphas. The alpha figures are based on the asset based factor model that is introduced in chapter. They represent the returns that cannot be explained by the observable market factors used in the model. I implement a simple regression analysis of the logarithm of size and a quadratic regression analysis to measure the impact of size on fund performance. The reason for using a quadratic regression is that many studies and tables 31 and 32 report a non-linear relationship between fund size and performance.

Table 30: Impact of size to annual returns

The table reports the effect of funds size to its annualized returns. In the linear regression, the logarithm of the average assets of each activist hedge funds are regressed on the average annualized returns. In the linear regression, the average annualized returns are regressed on the logarithms of the average assets of each of the activist hedge funds. In the quadratic regression, the average annualized returns are regressed on the logarithms of the average assets of each of the activist hedge funds and on the squared logarithms of the assets.

Dependent variable	Annualized return			
Independent variables	Coefficient	Std. error	t-statistics	Prob.
Linear regression				
C	0.054	0.143	0.377	0.707
LN(Assets)	0.004	0.007	0.632	0.528
R-squared	0.004			
Adjusted R^2	-0.006			
Quadratic regression				
C	1.786	1.184	1.507	0.135
LN(Assets)	-0.185	0.129	-1.431	0.155
$LN(Assets)^2$	0.005	0.003	1.472	0.144
R-squared	0.028			
Adjusted R^2	0.006			

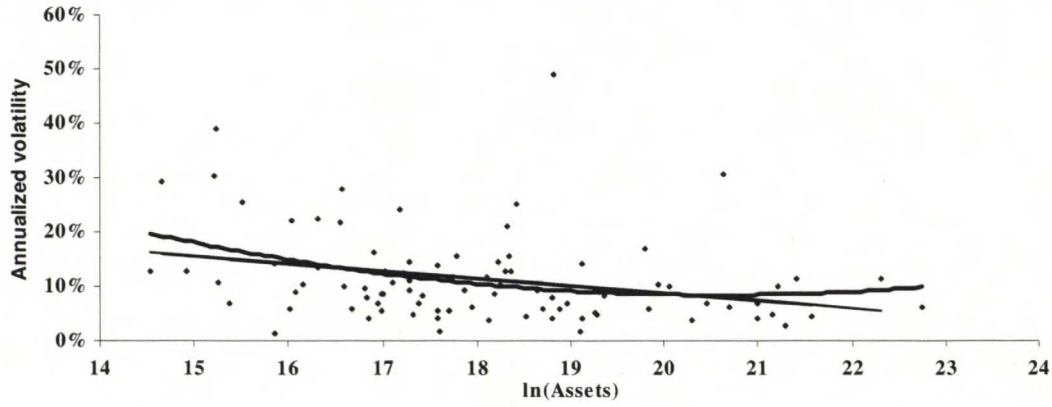


As the scatter plot above illustrates, the annualized returns of the funds are divided relatively uniformly through the population. The linear regression does not provide any support for the existence of a linear relationship between fund size and returns. There seems to be a slight convex relationship between the size of a fund and its annualized returns, which is in line with the findings of Hedges (2003). However, the t-statistics are not high enough to provide support for this relationship. No positive nor negative relationship between hedge fund size and performance is found. It is noticeable that the explanatory power of the model, measured by the R-square values, is extremely low for both of the models. This small R-square value indicates that the capability of the linear regression to explain the impact of size on a fund level is low. The purpose of the test is to merely identify a possible trend inside the population thus the overall explanatory power can remain low.

Table 31: Impact of size to annual volatility

The table reports the effect of funds size to its annualized volatilities. In the linear regression, the logarithm of the average assets of each activist hedge funds are regressed on the average annualized volatilities. In the linear regression, the average annualized volatilities are regressed on the logarithms of the average assets of each of the activist hedge funds. In the quadratic regression, the average annualized volatilities are regressed on the logarithms of the average assets of each of the activist hedge funds and on the squared logarithms of the assets.

Dependent variable	Annualized volatility			
Independent variables	Coefficient	Std. error	t-statistics	Prob.
Linear regression				
C	0.356	0.083	4.261	0.000
LN(Assets)	-0.013	0.004	-2.920	0.004
R-squared	0.087			
Adjusted R^2	0.077			
Quadratic regression				
C	1.389	0.692	2.007	0.047
LN(Assets)	-0.126	0.075	-1.678	0.096
$LN(Assets)^2$	0.003	0.002	1.503	0.136
R-squared	0.110			
Adjusted R^2	0.090			

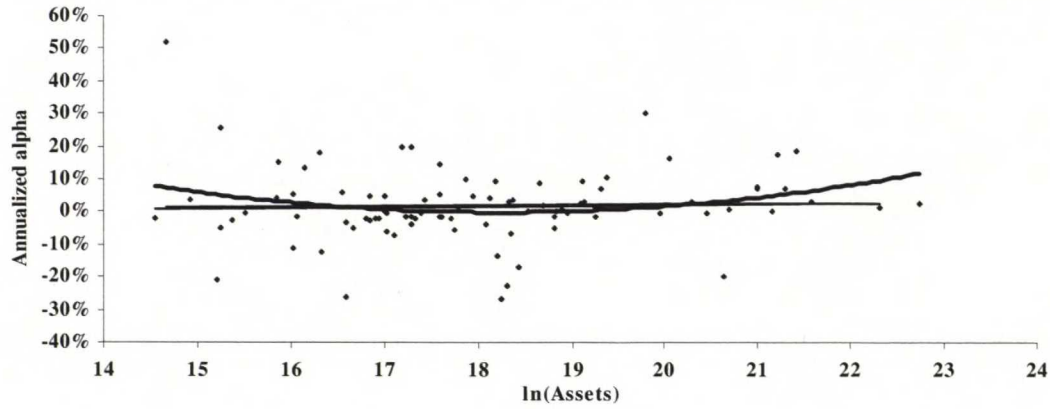


It is easy to spot on the scatter plot above that as the amount of assets increases the annualized volatility of the activist hedge fund diminishes. The findings of the linear regression provide support to the hypothesis that a negative relationship exists between fund size and volatility with 99% significance. Possible factors for the lower volatility of the largest hedge funds are the higher level of diversification, investments in more liquid shares, and the desire for continuity and a good reputation of the manager. When interpreting the findings it is important to notice that the number of funds decreases as the amount of assets under management increase. There is always a possibility that outside of this sample some large activist hedge funds have a much higher level of volatilities.

Table 32: Impact of size to alpha

The table reports the effect of funds size to its alpha that is measured by the asset based factor model that is introduced in section 5.2. In the linear regression, the logarithm of the average assets of each activist hedge fund is regressed on the fund's alpha. In the linear regression, the fund's alphas are regressed on the logarithms of the average assets of each of the activist hedge funds. In the quadratic regression, the fund's alphas are regressed on the logarithms of the average assets of each of the activist hedge funds and on the squared logarithms of the assets.

Dependent variable	Annualized alpha			
Independent variables	Coefficient	Std. error	t-statistics	Prob.
Linear regression				
C	-0.020	0.118	-0.168	0.866
LN(Assets)	0.002	0.006	0.324	0.746
R-squared	0.001			
Adjusted R^2	-0.010			
Quadratic regression				
C	1.932	0.972	1.986	0.050
LN(Assets)	-0.212	0.106	-1.998	0.048
$LN(Assets)^2$	0.005	0.002	2.021	0.046
R-squared	0.045			
Adjusted R^2	0.023			



The linear regression model does not provide support for a relationship between the size of an activist hedge fund and manager skill measured by alpha in the asset-based model of this thesis. The quadratic regression however reports a convex relationship between the size of the fund and its alpha significant on a 95% level. This finding is in line with Hedges (2003), who supports evidence that managers of the largest funds provide more added value to their investors than the managers of mid-sized funds.

It is difficult to estimate whether large funds are taking more or less exposure to risk factors that are not captured by the simple asset class factor model compared with small funds. There is a possibility that the findings of the regressions vary when the alphas are explained by different models. In order to keep to the scope of this study I have not implemented individual asset models or different piecewise linear regressions to test the model.

7.4.2 Robustness check

It is easy to argue that as shareholder activism is based on the power to acquire a target company the smallest funds in the sample cannot be "real" activists. Several studies, most recently the working paper by Greenwood and Schor (2007), report that shareholder activism is mainly focused on small firms. By using leverage and cooperation with other activist hedge funds or other shareholders, the smallest funds should also be able to follow an activist strategy. As a robustness check, the same quadratic regressions on returns, volatility and alpha were run only including funds with average net assets under management of over $17,000,000 during the sample period. This limit is based on the findings of Boyson and Mooradian (2007) reporting this to be an average block size when shareholder activists flag their ownership. The results of this check, now including 72 hedge funds, are in line with the findings reported in section 6.4.

Chapter 8. Conclusions

During the last two decades the role of hedge funds in the modern financial markets has been under severe discussion as the funds have gained enormous power as their assets have augmented at an increasing pace. The current situation may be just a foretaste of things to come as the enormous increase in the number of hedge funds has driven them to explore alpha from new investment strategies. During the last few years hedge funds have entered into the market of corporate control as they have started activist campaigns to influence the strategic and financial decisions of companies and governances. Various specialist forecasts and business newspapers state that hedge funds are likely to go into overdrive in shareholder activism seeking to pick up less known assets with the only intention of extracting maximum value within a minimum time.

Even though activist campaigns are more than regular topics in business media, virtually no finance literature has studied the phenomenon more deeply yet.

Working papers from Brav et al (2006), Klein and Zur (2006) and Boyson and Mooradian (2007) discuss the characteristics of the target companies of activism and the market reaction to a published activist campaign but this is the first study to analyze its profitability for the investors who are the ones that eventually finance this recent phenomenon.

This study contributes to existing research in numerous ways. First, it is the first public study to analyze and explain the performance of activist hedge funds. The performance of activist funds is compared with that of other hedge fund strategies and observable market risks in order to capture and measure the added value that shareholder activists offer to their investors. In addition, this thesis examines the market exposures that the activist hedge funds have to provide evidence on the sources of return in shareholder activism of hedge funds from an investor's point of view. By reporting the exposures of the activist funds, investors can clearly see how adding shareholder activism into ones portfolio affects its characteristics. Again this is information that has not yet been studied - apart from possible private studies of asset managers that remain in secrecy. Third, this thesis provides evidence on the impact of size of activist hedge funds on its annualised returns, annualised volatility and alpha. This is new evidence that has not yet been found. Fourth, the study uses the most up-to-date data on hedge funds and is able to provide new evidence to question the common belief and conclusions of various studies, such as Fung et. Al (2006), Greupner (2003) and Loyes and Fransolet (2004) about the stagnation of results in the traditional hedge fund strategies. Finally, the research data includes performance information of three large activists who contribute to shareholder activism with aggregate assets of over $15 billion and are out of the scope of other studies.

The key findings of the thesis are that at first sight shareholder activists as a group have outperformed all other hedge fund strategies. However, as the level of risk and diversification benefits should be taken into account as well, there is not enough evidence that shareholder activists would be better investments than the more traditional hedge funds strategies. Shareholder activist funds as a group have created an annualised alpha of 4.6%-6.5%. There is a strong evidence that the level of risk, measured by volatility, of shareholder activist hedge funds decreases as fund size grows and that the largest activists provide more alpha than the middle sized activists.

The remaining parts of the chapter discuss the findings of the thesis more in detail and suggest areas for future research in the field of activist hedge funds. A summary of the findings on the research questions and support or rejection for the hypotheses is presented in Table 33 at the end of Section 7.1.

8.1 Discussion of the central findings

This section discusses the findings of the thesis in more detail.

8.1.1 The performance of activist hedge funds

The relative performance of activist hedge funds against general hedge fund strategies has been evaluated by traditional attribution measures, strategy ranking that incorporates multiple decision criteria, correlation with traditional equity indices, beta with individual style indices and finally by a linear regression model where the applicable hedge fund style indices have been used as independent variables. It can be concluded that, in general, activist hedge funds have provided higher average returns than any other hedge fund strategy, apart from emerging markets funds. However, the high returns come at cost: the level of risk of activists is higher than that of traditional hedge fund strategies. There is also evidence that activist hedge funds are relatively highly correlated with general equity indices, which makes the use of the word "hedge" in the name of the instrument questionable.

A direct performance comparison provides evidence that activist hedge funds have been profitable investments for their investors. The main benefit they have is the realization of more stable returns over a specified target level that can be measured by Omega. Though, this is the only dimension of performance attribution were activists have outperformed other hedge fund strategies. In order to evaluate whether activist hedge funds have generated returns that are not captured in other hedge fund strategies, a style model is used where the returns of activists are explained by hedge funds style strategies. This approach provides evidence that activist funds as a group have generated an annualised alpha of approximately 2.5% against traditional hedge fund strategies.

However, the finding applies only to the largest funds as a change from using asset-weighted performance to using the mean of all the activists eliminates the added value activist funds have in comparison to other hedge fund strategies. In other words: only the largest activists seem to outperform traditional hedge funds strategies.

8.1.2 The market risk of hedge funds

A linear regression model using observable market factors as independent variables is able to explain the variance in the performance of activist hedge funds relatively well. The performance of the activist strategy depends strongly on the success of the activist campaign and so bears a high event risk. The study shows that activist hedge funds have generated statistically significant annualised alphas of 5% to 6% on average, which is in-line with the findings on abnormal returns of the event studies on activist campaigns. For example Klein and Zur (2006) reported statistically significant abnormal returns of 7.3% on average around the announcement date[14] of an activist campaign. By combining the findings of this study with existing research, it can be concluded that the main part of a shareholder activist's alpha is generated on the announcement date of an activist campaign.

The study of Greenwood and Schor suggests that hedge funds may be better suited to identify undervalued targets and prompting a takeover, than to engage in long-term corporate governance or operating issues. When alpha figures are compared with the total returns of activist funds, it is evident that roughly one third of the total return can be explained by shareholder activism and the rest derives from long positions in target companies.

The relatively high factor loadings in SMB and HML factors clearly prove that the remaining two thirds of the activist funds' returns are exposure to investments in companies with small capitalisation and with low price-to-book value – a classical characteristics of value investing. It is important to notice that these stocks can also be highly illiquid and practitioners have already come up with a term "roach motel" to describe situations in which several activists hold large illiquid positions in a poorly performing target firm. "Roach motel" refers to the fact that it is easy for the "roaches" to get into the position, but difficult to get out.

The findings on the asset-based model are in-line with all the published event studies on activist campaigns. Information related to alpha of activist funds and its relation with the total return of funds is new.

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[14] (-30 + 5 days)

8.1.3 Impact of asset size

As the scatter plot of Table 30 illustrates, no statistically significant conclusions can be derived from the relationship between the size of an activist fund and its returns. However, the volatility of an activist fund clearly decreases as the asset size grows. This might be explained by higher diversification efforts of larger companies or their avoidance of the most risky and illiquid target companies. Hedges (2003) points out that in general, as the size of a hedge fund grows, more emphasize is put on the operational side of investing such as risk management. This could also be a factor for the decreasing level of risk.

The results of both style based model and asset-based regressions provide evidence on higher abnormal returns of the largest activist funds. The quadratic regression where alpha is explained by a fund's asset size confirms this findings and so it can be concluded that the largest activists have added more abnormal returns than their mid-sized or small peers.

Finally, Table 33 on the next page summarizes the results of the study.

Table 33: Results on the research questions

This table summarizes whether the research hypotheses can be supported or rejected on the basis of the tests done in this thesis. The column significance level reports the lever of significance (a possibility for Type 1 error i.e. rejecting the null hypothesis when it is actually true.

Hypothesis	Significance level	Support / reject	Comment
H1: Activists hedge funds offer higher returns than hedge funds in general	95%	Support and Reject	During the sample period, the activist funds did indeed have higher returns than other hedge fund strategies but hedge funds investing in the Emerging Markets outperformed activities funds. One could question whether the Emerging Markets funds should be rather labeled as mutual funds investment-wise.
H2: Activist hedge funds offer higher abnormal returns (alpha) than hedge funds in general	95%	Reject	Style model where the returns of the mean of activist hedge funds is explained by the return of other hedge fund strategies did not support the hypothesis on higher level of alphas.
H3: Activist hedge funds offer hedging to their investors in a form of low correlation with the general equity indices	99%	Reject	Activist hedge funds have the highest correlation with equity markets out of all the studies hedge funds strategies. They also have a statistically significant beta of over 0.2 with MSCI World index.
H4: Performance of the activist hedge funds can be explained by value investing	99%	Support	Proxy for value investing (HML) is statistically significant in three regressions out of four.
H5: Performance of the activist hedge funds can be explained by the performance of small capitalization stocks	99%	Support	Proxy for investing in small cap (SMB) is statistically significant in all four regressions where the returns of activist funds are explained by observable market factors.
H6: Changes in credit spread affect the returns of the activist funds.	95%	Reject	Monthly change in the credit spread was not a significant variable in any of the asset-based regressions.
H7: Returns of activist hedge funds increase along with an increase in fund size	95%	Reject	Regressions analysis where the sizes of the activist hedge funds were used as independent variables did not provide sufficient support for the hypothesis.
H8: The largest activists are less risky	95%	Support	Linear regression where the annualized volatilities of activist hedge funds are explained by their asset size provides support on the hypothesis of decreasing level of risk (measured by volatility) when the size of fund's assets increase.
H9: The largest activists hedge funds have higher alphas	95%	Support	Regression models with higher weight on the returns of the largest activists had higher alpha figures than mean returns of all the activists included in the study. The quadratic regression on the alphas reports a convex slope for the alpha-size diagram, which also supports the null hypothesis on increasing alphas when the asset size gets higher.

8.2 Suggestions for future research

Rob Minsky, head of the hedge fund practise of Deloitte, claims Europe to have clear inefficiencies in corporate governance that should make activist investing a big theme over the next few years. As this thesis is first of a kind to explain the performance of activist hedge funds, some suggestions for future research can be given on the basis of the findings of this thesis. First, using a different time horizon such as quarterly returns and a different database can increase the robustness of the results of this study.

Also the investment focus of an activist hedge fund provides an interesting path of study. This study did not pursue to explain reasons for some activists funds to perform better than the others. One explanation could lie in the investment preferences of the activist i.e. do activists speculating in certain industries perform better than others.

Size is the only fund specific factor included in this study. Other factors, for example the maturity, fee structure or domicile of an activist fund might explain its performance. An interesting study to read would be a comparison between the investment performance and fund characteristics between the U.S. activists and their European counterparties.

Additionally, more information is needed on the style drifts of activist funds. Questions like "have traditional hedge funds changed their strategy into activism or are activists hedge funds rather founded by new managers?" remain without answer. Finally, a comparison with the risk and returns characteristics of activist hedge funds and private equity investments offer a fertile field for future studies.

Appendix A. Risk framework for hedge fund

- Market risks are the most obvious risks that derive from the underlying assets where the hedge funds invest. Hull (1990) argues that the random arrival of new information about the stock's future returns and the level of trading activity mainly cause the security specific risk that can be also referred to as the volatility of the security.
- Interest rate risk is caused by the parallel shift on the yield curve and credit spreads.
- The level of directional risk depends on the hedge fund's exposure to the markets.
- The Greeks risk refers to the risk involved in the derivative instruments that several hedge funds implement in their investment strategies.
- Event risk refers to an unforeseen value-affecting event taking place in the underlying security or in the markets.
- Asset liability risks exist due to the special characteristics of hedge funds and so their importance might differ between hedge funds and mutual funds.
- Liquidity risk refers to a situation where the hedge fund runs out of cash because it has invested, for example, in illiquid assets and cannot meet the requirement needed to back its short-selling or other investment activities. To protect themselves from liquidity problems in case of redemptions, hedge funds often apply earlier mentioned lock-up periods.
- Capacity risk exists because of too limited investments opportunities for hedge funds. One of the assumptions behind this thesis is that the increasing number of hedge fund has led to higher capacity risk, because more funds are investing in the same market inefficiencies.
- Correlation risk occurs when the assets in the hedge fund's portfolio that were assumed not to correlate start correlating. One of the most famous examples is Long Term Capital Management. Their independent investments started to correlate with each other, against all the provisions, mainly due to the Russian rouble crisis.
- Position risk refers to a situation where the other players become aware of the investments of a hedge fund and start benefiting from those, and thus erode the abnormal returns.

- Herding risk refers to a situation where the numbers of hedge funds that adopt the same strategies increase and so erode the existing market opportunities.
- Stale pricing takes place when the investment instrument is illiquid (e.g. an OTC instrument) and therefore lacks the correct daily valuation.
- Even if the investment strategy of the hedge fund is sound, it might still crash due to the operational issues. Several hedge funds are small enterprises with only a few employees that mainly have trading backgrounds and lack extensive knowledge on risk management or back office operations.
- The risk of losing key personnel, for example, to other hedge funds is a human risk.
- Style shift risk is the possible change into a new investment strategy where the hedge fund manager might lack expertise to gain alpha.
- Model risk occurs when the model being used is wrong or includes errors.
- Credit risk referrer to a situation where the credit worthiness of a hedge fund, its investments or counter parties is downgraded.
- Legal risk is self-explanatory and refers to the problems that hedge fund might face in complying their legal or contractual requirements or even act illegally.

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Appendix 1. Cumulative returns of various indices from January 2002 to December 2006

Figure A presents the cumulative returns of S/P500 and MSCI World equity indices and selected CSFB hedge fund indices. Activist Index corresponds to an asset weighted average of monthly returns of the 92 activist hedge funds included in this study. Both equity indices are total return figures and activist indices net of fee returns.

Figure A

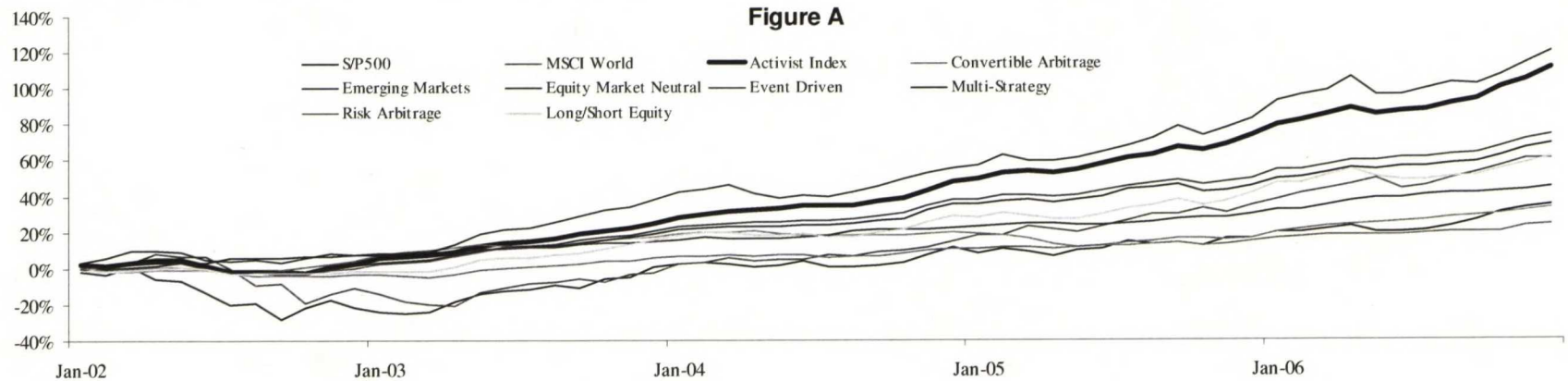

Figure B